1992 Operational Plan
Project Summary

Project: Marlboro RI

Major Program Name: Flavor Technology

Strategic Goal: #4; Cost/Quality

Oper. Plan No.:

Date Prepared: 8/14/92

Prepared By: B.G.Taylor

Start Date: 1990

Completion Date: April, 1993

Strategy #	Tactic #	Project Tactics	Responsible Person(s)	1992 1	1992 2	1992 3	1992 4	1993 1	1993 2	1993 3	1993 4
1	1	Development of new casing and aftercut systems.	Garrett/		x						
			Taylor				x				
1	2	Evaluate most recent blend models.	Garrett	x							
1	3	Request new blend components.	Garrett	x							
1	4	Produce new RLL at C Pilot Plant.	Taylor/Swain	x							
1	5	Produce new ET with sucrose at D Pilot Plant.	Garrett	x							
1	6	Chemical and physical analyses.	Garrett		x						
1	7	Evaluation of new components (expanded & recons).	Garrett/		x						
			Taylor			x					
1	8	Evaluate NET expanded materials.	Garrett/		x						
			Taylor			x	x				
1	9	Recommendation of blend components.	Garrett/	x	x						
			Taylor			x					
1	10	Production of new blend.	Garrett/		x						
			Taylor			x					
1	11	Evaluation of new blend.	Taylor			x					
1	12	Panel testing.	Taylor				x				
2	1	Evaluation of flavor components.	Garrett		x						
2	2	Optimize flavor levels, examine modification to the burley spray, and optimize casing and flavor levels.	Garrett/		x						
			Taylor			x					
2	3	POL testing.	Smith				x				
2	4	Continue assessment, make modifications.	Taylor				x				
2	5	Recommendations	Taylor						x		
3	1	Evaluate flavor components, optimize flavor levels	Bell				x				
3	2	Internal Subjectives	Bell				x				
3	2	Recommendation	Bell				x				

Group Resource Allocation Summary

Individuals	Man-Years	Individuals	Man-Years	Individuals	Man-Years
Garrett	0.10	Bell	0.10		
Taylor	0.10				
Swain	0.05				
Subjective Eval.	0.01				

R&D Support Resources (Type of Support)	Division	Man-Years
Pilot RL's/C Pilot Plant	Process Develop.	
Pilot ET/D Pilot Plant	Process Develop.	
Cigarette Design	Cigarette Tech.	
Cigarette Analysis	CTSD	
	ARD	
POL Testing.	PED	
Prototype/POL fabrication	Semi-Works	

2021385956

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992-1996 Five Year-Plan
Project Summary

Project: Flavor Revisions/Flavor Center Issues

Category: #1&2 Regulatory/Quality/Cost **Included in 1991-1995 Plan:** I-13

Start Date: Ongoing **Completion Date:** Ongoing

Project Objective:
To eliminate unwanted ingredients from the PM direct materials to comply with world-wide legal requirements. To reduce ingredients and simplify sources of materials.

To subjectively evaluate materials from the Flavor Center which show borderline analytical results.

Background:
The project involves work by Flavor Technology, Regulatory, Operations Technical Services, Purchasing and the Flavor Center in an effort to maintain and control the quantity and quality of Philip Morris direct materials used in our products.

Benefits/Risks:
Benefits: Regulatory compliance, reduced cost and reduced inventory.

Risks: Revised flavors may require additional effort to maintain subjective integrity of PM products.

Project Leadership Department: R&D **Group:** Flavor Technology
Program Leader: Cox/Kroustalis **Man-Years:** 0.71

External Support	1992 Man-Years
Operations Technical Services	0.80
Regulatory	0.60
Flavor Center	0.05
Purchasing	0.10

BUDGET:
SW Tobacco _____ POL Testing _____ Materials _____
Other (Specify Type) _____

Project Strategies:

#	Year	1992				1993				1994				1995				1996			
	Qtr.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Evaluate revisions and first shipments				X				X				X				X				X
2	Evaluate alternate vendors				X				X				X				X				X
3	Reduce the number of PM sole source ingred.				X				X				X				X				X
4	Evaluate flavor and quality issues				X				X				X				X				X
5	Simplify flavor formulations				X				X				X				X				X

2021385957

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992 Operational Plan
Project Summary

Project: Flavor Revisions/Flavor Center Issues

Major Program Name: Flavor Technology

Strategic Goal: #1 Regulatory #2 Quality/Cost

Oper. Plan No.: _____
Date Prepared: 8/20/92
Prepared By: J. Pflueger
Start Date: Ongoing
Completion Date: Ongoing

Strategy #	Tactic #	Project Tactics	Responsible Person(s)	1992 1	1992 2	1992 3	1992 4	1993 1	1993 2	1993 3	1993 4
1	1	Subjectively evaluate revisions/shipment samples	J. Pflueger				X				X
2	1	Subjectively evaluate alternate vendors	J. Pflueger				X				X
3	1	Removal of ingredients/flavor development	J. Pflueger				X				X
3	2	Supply Technical Services with new formulations	J. Pflueger				X				X
3	3	Subjectively test new formulations	Pflueger/Hosk				X				X
4	1	Subjectively test quality/flavor related issues	Pflueg./Taylo				X				X
4	2	Analytical verification	A. Palmer				X				X
5	1	Subjectively test reduced ingredient formulations	Pflueger				X				X

Group Resource Allocation Summary

Individuals	Man-Years	Individuals	Man-Years	Individuals	Man-Years
J. Pflueger	0.60				
A. Palmer	0.05				
B. Taylor	0.01				
B. Hoskin	0.05				

R&D Support Resources (Type of Support)	Division	Man-Years

2021385958

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992-1996 Five Year-Plan
Project Summary

Project: Project Levo

Category: #1: Cost/Productivity **Included in 1991-1995 Plan:** D-12

Start Date: Ongoing **Completion Date:** 4th quarter 1992

Project Objective: The objective of this project is to decrease PM's dependence on natural menthol through the use of synthetic menthol.

Background: The price of Natural menthol varies on the open market. Success in this program will allow for use of synthetic menthol.

Benefits/Risks: Project Levo was designed as a cost reduction program for PM's menthol products.

Project Leadership Department: R&D **Group:** Flavor Technology
Program Leader: C. Kroustalis/Cox **Man-Years:** 0.35

External Support	1992 Man-Years
Purchasing/Joe Griffin	.05
Operations Services/E. Cook	.05

BUDGET:
SW Tobacco _____ POL Testing _____ Materials _____
Other (Specify Type) _____

Project Strategies:

#		Target Completion Dates																			
	Year	1992				1993				1994				1995				1996			
	Qtr.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Develop and evaluate prototypes with synthetic menthol and additives	x																			
2	Establish baseline for further testing		x																		
3	Evaluate other major menthol brands			x																	
4	External Testing			x																	

2021385959

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992 Operational Plan
Project Summary

Project: Project Levo

Major Program Name: Flavor Technology

Strategic Goal: #1 Cost/Productivity

Oper. Plan No.:
Date Prepared: 8/13/92
Prepared By: Shelton
Start Date: Ongoing
Completion Date: 4thQtr1992

Strategy #	Tactic #	Project Tactics	Responsible Person(s)	1992 1	1992 2	1992 3	1992 4	1993 1	1993 2	1993 3	1993 4
1	1	Internal evaluations of B&H 100's Menthol	J. Shelton	x							
2	1	POL test B&H 100's Menthol	J. Shelton		x						
3	1	Internal evaluations of Marlboro Menthol and Merit Menthol KS	J. Shelton			x					
4	1	POL test Marlboro Menthol and Merit Menthol KS	J. Shelton			x					
		Make recommendation	J. Shelton				x				

Group Resource Allocation Summary

Individuals	Man-Years	Individuals	Man-Years	Individuals	Man-Years
J. Shelton	.25	FTD Panel	0.10		

R&D Support Resources (Type of Support)	Division	Man-Years
POL Testing	PED	
Prototype/POL fabrication	Semi-Works	
Cigarette Design (Monahan, Spruill)	Cigarette Technology	0.20
Cigarette Analysis	CTSD	

2021385960

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992-1996 Five Year-Plan
Project Summary

Project: Natural Glycerin/Triacetin

Category: #1: Cost/Productivity **Included in 1991-1995 Plan:** I-17 & D-12

Start Date: January, 1992 **Completion Date:** March, 1993

Project Objective:

1. To determine by subjective and analytical methods the acceptance specification of natural glycerin.
2. To qualify natural glycerin-based triacetin as cigarette filter plasticizer.
3. To identify impurities in natural glycerin/triacetin which may impart off flavors in cigarettes.

Background:

Glycerin shipments have been rejected based on subjective evaluations. There exists a need for combining subjective with analytical criteria to minimize rejections. Cost reductions and supply security require that natural glycerin-based triacetin be tested in a similar fashion as glycerin to ensure supply security, acceptable cost and meet PM's subjective product integrity.

Benefits/Risks:

Benefits: Reduced rejections, cost, supply security via vendor partnering and alternate vendors.

Risks: Stringent PM requirements may limit the number of alternate vendors or may involve up front investment by PM to ensure subjective product integrity.

Project Leadership Department: R&D **Group:** Flavor Technology

Program Leader: Kroustalis/Cox **Man-Years:** 0.45

External Support	1992 Man-Years
Purchasing/B. Johnson	0.02
Semi-Works/T. Hoskin	0.02
Filter Technology/A. Finley	0.01
Technical Services/Flavor Center	

BUDGET:

SW Tobacco _____ POL Testing _____ Materials _____

Other (Specify Type) _____

Project Strategies:

#	Strategies	Target Completion Dates																			
	Year	1992				1993				1994				1995				1996			
	Qtr.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Subjective evaluations (gly/TA)			x																	
2	Analytical characterization (gly/TA)			x																	
3	Analytical/sensory correlations/guidelines				x																
4	POL testing					x															

2021385961

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992 Operational Plan
Project Summary

Project: Natural Glycerin/Triacetin

Major Program Name: Flavor Technology

Strategic Goal: #1: Cost/Productivity

Oper. Plan No.:

Date Prepared: 8/5/92

Prepared By: K. Lam

Start Date: Jan., 1992

Completion Date: March, 1993

Strategy #	Tactic #	Project Tactics	Responsible Person(s)	1992 1	1992 2	1992 3	1992 4	1993 1	1993 2	1993 3	1993 4
1	1	Preparation of cigs. containing nat. glycerin	K. Lam	x							
1	1	Subjective evaluation of above cigarettes	Willis/Deane		x						
1	2	Preparation of cigs. with natural glycerin-TA	Lam/Finley		x						
1	2	Subjective evaluation of above cigarettes	Willis/Deane			x					
2	1	Analytical characterization of glycerin/TA	Lam/Hale				x				
3	1	Batch variation det. of natural gly.-based TA	Lam			x					
3	2	Analytical/sensory correlations	Lam/Willis				x				
3	3	POL testing	PED					x			
3	4	Recommendation for use of natural glycerin/TA	Lam/Hale					x			

Group Resource Allocation Summary

Individuals	Man-Years	Individuals	Man-Years	Individuals	Man-Years
FTD Panel	0.15				
K. Lam	0.15				
R. Hale	0.15				

R&D Support Resources (Type of Support)	Division	Man-Years
Prototype/POL fabrication	Semi-Works	0.02
POL testing	PED	
Filter fabrication	Filter Technology	0.01
Cigarette Testing	CTSD	

2021385962

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992-1996 Five Year-Plan
Project Summary

Project: Uncooked Flavor System (75-814 Replacement)

Category: #4: External Requirements **Included in 1991-1995 Plan:** I-13

Start Date: March, 1992 **Completion Date:** Sept. 1993

Project Objective:
To replace cooked flavor for RLTC due to possible regulatory changes.

Background:
The definition/safety of reaction flavors are being questioned in some Foreign countries. As a precautionary measure, an alternate will be developed for Cooked Flavor 75-814.

Benefits/Risks: Defensive development to maintain flavor system for RLTC.

Project Leadership Department: R&D **Group:** Flavor Technology
Program Leader: Kroustalis/Cox **Man-Years:** 0.06

External Support	1992 Man-Years
Park 500	
Flavor Center	
Operation Services	

BUDGET:
SW Tobacco _____ POL Testing _____ Materials _____
Other (Specify Type) _____

Project Strategies:

#	Year	1992				1993				1994				1995				1996			
	Qtr.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Develop, evaluate, and test alternate flavor in RLTC.							x													

2021385963

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992 Operational Plan
Project Summary

Project: Uncooked Flavor System (75-814 Replace.)

Major Program Name: Flavor Technology

Strategic Goal: #4: External Requirements

Oper. Plan No.:
Date Prepared: 8/14/92
Prepared By: B.G. Taylor
Start Date: March, 1992
Completion Date: Sept. 1993

Strategy #	Tactic #	Project Tactics	Responsible Person(s)	1992 1	1992 2	1992 3	1992 4	1993 1	1993 2	1993 3	1993 4
1	1	Initiate flavor modifications.	B. Taylor	x							
1	2	Subjective evalaution of flavors applied lab-scale.	B. Taylor		x						
1	3	Subjective evaluation of flavors in RL Pilot trials.	B. Taylor			x					
1	4	Modifications, if necessary prior to Park 500 trials.	B. Taylor			x					
1	5	Park 500 trials of alternate flavor for POL test.	B. Taylor/ J. Swain						x		
1	6	Complete POL tests of substitutions as contingency to respond to potential regulatory changes.	B. Taylor							x	

Group Resource Allocation Summary

Individuals	Man-Years	Individuals	Man-Years	Individuals	Man-Years
B. Taylor	0.05				
J. Swain	0.01				

R&D Support Resources (Type of Support)	Division	Man-Years
Cigarette Design	Cigarette Tech.	
Pilot Plant Trials	Process Develop.	
Cigarette Analyses	CTSD/ARD	
POL Testing	PED	
Cigarette Fabrication	Semi-Works	

2021385964

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992-1996 Five Year-Plan
Project Summary

Project: Burley Casing Components

Category: #1: Quality/Productivity/Cost **Included in 1991-1995 Plan:** D-12

Start Date: Ongoing **Completion Date:** December, 1993

Project Objective: Develop Burley Spray specifications for factory primaries and investigate alternate components which will permit greater flexibility in ingredients and reduced production cost.

Background: Current Burley Spray holding time and temperature specifications have limitations with regard to casing use and flexibility. Reduced holding temperature should extend holding time without affecting subjectives and offer energy cost savings. Alternate acceptable components will permit more flexibility and reduced costs.

Benefits: Quality/Cost/Unformity/Environmental
Risks: Subjective integrity of products

Project Leadership Department: R&D **Group:** Flavor Technology
Program Leader: Cox/Willis/Yatrakis **Man-Years:**

External Support	1992 Man-Years
Technical Services	
Purchasing	

BUDGET:
SW Tobacco _____ POL Testing _____ Materials _____
Other (Specify Type) _____

Project Strategies:		Target Completion Dates																			
	Year	1992				1993				1994				1995				1996			
#	Qtr.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	SEE TACTICS																				

2021385965

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992 Operational Plan
Project Summary

Project: Burley Casing Components

Major Program Name: Existing Product Support

Strategic Goal: #1: Quality/Productivity/Cost

Oper. Plan No.:
Date Prepared: 8/13/92
Prepared By: D. Spruill
Start Date: Ongoing
Completion Date:

Strategy #	Tactic #	Project Tactics	Responsible Person(s)	1992 1	1992 2	1992 3	1992 4	1993 1	1993 2	1993 3	1993 4
1		Subjectively evaluate Burley spray with sucrose vs. fructose & glucose. Completed. N.S.D. internal testing									
2		Evaluate Burley spray processing modifications									
	1	Make cigts. in SW with Burley spray at 180° vs. 150° at 3 hr. & 72. hold time					x				
	2	Monitor microbial activities at specified times					x				
	3	Evaluate extended hold time at reduced temperature					x				
	4	Recommendations						x			
3		Evaluate alternate sources of block chocolate									
	1	Investigate alternate suppliers				x					
	2	Evaluate current product vs. alternate sourced product: processing & subjectives				x					
	3	Repeat testing for confirmation - recommendations					x				
4		Evaluate removal of cochise									
	1	Evaluate casings with and without cochise: processing & subjectives						x			
5		Develop licorice substitute for current products									
	1	Evaluate with and without - current system			x						
	2	Evaluate w & w/o - projected blend formulations				x					
	3	Continue isolation/identification of components						x			
	4	Subjective characterization of isolated components						x			
	5	Evaluate reduced level with compounded substitutes								x	
	6	Evaluation of compounded licorice substitutes								x	
	7	POL - recommendation									x
6		Evaluate the replacement of sucrose with isosweet									
	1	Test processing and subjectives					x				

Group Resource Allocation Summary

Individuals	Man-Years	Individuals	Man-Years	Individuals	Man-Years
W. Bell	0.2	K. Parrish	0.2		
D. Spruill	0.2	N. Jackson	0.2		
J. Sherron	0.3	FTD Panel	0.2		
R. Hale	0.1				

R&D Support Resources (Type of Support)	Division	Man-Years
Prototype/POL fabrication	Semi-Works	
POL testing	PED	
Cigarette analysis	CTSD	
Cigarette design	Cigarette Technology	

2021385966

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992 Operational Plan
Project Summary

Project: Burley Casing Components

Major Program Name: Existing Product Support

Strategic Goal: #1: Quality/Productivity/Cost

Oper. Plan No.:
Date Prepared: 8/13/92
Prepared By: D. Spruill
Start Date: Ongoing
Completion Date:

Strategy #	Tactic #	Project Tactics	Responsible Person(s)	1992 1	1992 2	1992 3	1992 4	1993 1	1993 2	1993 3	1993 4
7		Evaluate Burley casing components for generic products									
	1	Prepare and test casings with sucrose vs. isosweet subjective, analytical & microbial					x				
	2	Prepare and test casings with cochise, licorice and block chocolate removed from traditional casing - complete			x						
	3	Evaluate extended hold time at current specifications, subjective - analytical - microbial					x				
	4	Recommendations					x				
8		Test total modification on existing products									
	1	Combine all acceptable modifications of the Burley casing system									x
9		Reduction of PG in current Burley casing systems - emissions									
	1	Subjective evaluations of increment reductions									

Group Resource Allocation Summary

Individuals	Man-Years	Individuals	Man-Years	Individuals	Man-Years

R&D Support Resources (Type of Support)	Division	Man-Years

2021385967

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992-1996 Five Year-Plan
Project Summary

Project: Subjective Flavor Evaluation

Category: Support Included in 1991-1995 Plan: N/A

Start Date: September, 1991 Completion Date: Ongoing

Project Objective: Create and update a database for all vendor submissions, DM coded items and preblends produced/inventoried at the Flavor Center.

Background:

Benefits/Risks: Benefits: (1) Provide information to all members of Flavor Technology for development work. (2) Subjective evaluation information for PM Purchasing. (3) Enhance relationships with vendors by providing useful feedback. (4) Maintain a library for material safety data sheets to comply with government regulations.

Project Leadership Department: R&D **Group:** Flavor Technology
Program Leader: Yatrakis/Cox **Man-Years:**

External Support	1992 Man-Years
Flavor Operations/E. Cook	.05

BUDGET:
SW Tobacco 600 lb. POL Testing Materials
Other (Specify Type)

Project Strategies:

#	Year	1992				1993				1994				1995				1996			
	Qtr.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Expedite evaluation of vendor samples, DM coded items and preblends																				
2	Maintain database																				

2021385968

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992 Operational Plan
Project Summary

Project: Subjective Flavor Evaluation

Major Program Name: Flavor Technology

Strategic Goal: #1 - Support

Oper. Plan No.:

Date Prepared: 8/14/92

Prepared By: S. Skalak

Start Date: September 1991

Completion Date: Ongoing

Strategy #	Tactic #	Project Tactics	Responsible Person(s)	1992 1	1992 2	1992 3	1992 4	1993 1	1993 2	1993 3	1993 4
1	1	Prepare samples of vendor submissions for group subjective evaluation.	S. Skalak								
1	2	Subjective evaluation of vendor submissions	Flavor Technology Division								
2	1	Enter information into database	S. Skalak								
2	2	Distribute reports of subjective evaluations to vendors	S. Skalak								
2	3	Maintain a library of MSDS on all submissions	S. Skalak								

Group Resource Allocation Summary

Individuals	Man-Years	Individuals	Man-Years	Individuals	Man-Years
S. Skalak	.25				
Vendor Panel	.10				

R&D Support Resources (Type of Support)	Division	Man-Years

2021385969

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

PACKAGING TECHNOLOGY

2021385970

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992-1996 Five Year-Plan
Project Summary

Project: Alternate Film Testing

Category: Quality/Cost/Productivity **Included in 1991-1995 Plan:** _____

Start Date: September, 1991 **Completion Date:** December, 1993

Project Objective: Determine the impact of overwrapping cigarettes with alternate film materials.

Background: Based on information from simulated studies on products in shipping containers and the Export Product Standardization, a program was formulated to address several issues. Preliminary testing was conducted with improved sealant layer films and metallized films. Analytical procedures for measuring permeability of flavor compounds on different overwraps are currently being developed.

Benefits/Risks: The benefits includes increased stability of our products, the possibility of increasing our field hold times and maintaining the subjective character of our products in the field.

Project Leadership Department: R&D **Group:** Existing Prod. Support
Program Leader: Willis/Cox **Man-Years:** 1.58

External Support	1992 Man-Years
Quality Engineering	
Packaging Technical Services	
Purchasing	
Manufacturing Support	

BUDGET:
SW Tobacco _____ **POL Testing** _____ **Materials** _____
Other (Specify Type) _____

Project Strategies:

#	Project Strategies	Target Completion Dates																			
	Year	1992				1993				1994				1995				1996			
	Qtr.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Determine the impact of improved sealant layers. Determine the impact of alternate films on moisture levels and subjectives.								x												
2	Determine the feasibility of metallized films.								x												
3	Determine the effects of cycling conditions		x																		
4	Determine the effects of subjectives and flavors at adverse conditions on Marlboro			x																	
5	Determine the effects of subjectives and flavors at adverse conditions with products that have carbon filters			x																	

2021385971

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992 Operational Plan
Project Summary

Project: Alternate Film Testing

Major Program Name: Existing Product Support

Strategic Goal: One - Quality/Cost/Productivity

Oper. Plan No.:
Date Prepared: Aug. 18, 1992
Prepared By: V. Willis
Start Date: Sept. 1991
Completion Date: Dec. 1993

Strategy #	Tactic #	Project Tactics	Responsible Person(s)	1992 1	1992 2	1992 3	1992 4	1993 1	1993 2	1993 3	1993 4
1	1	Produce, test and evaluated Marlboro LS (control films and the Hoechst high barrier	V. Willis	x	x						
1	2	Recommendations			x						
1	3	Recommend testing procedure for alternate films	V. Willis		x						
1	4	Evaluate the high barrier film under adverse conditions for extended use.	V. Willis/ P. Thomas						x		
1	5	Preliminary recommendations (Subjective)	V. Willis/ K. Deane			x					
1	6	Initiate testing of new materials when available	V. Willis				x	x			
1	7	Recommendations	V. Willis					x			
2	1	Recommend testing procedure for metallized foil	V. Willis		x						
2	2	Evaluate the metallized film under various adverse conditions for extended use	V. Willis/ P. Thomas						x		
2	3	Preliminary recommendations (Subjective)	V. Willis/ K. Deane			x					
2	4	Initiate testing of new materials when available	V. Willis				x	x			
2	5	Recommendations	V. Willis					x			
3	1	Complete evaluation of models shipped to KGF	V. Willis	x							
3	2	Repeat testing at KGF with modified conditions	M. Mobrem		x						
3	3	Recommendations	V. Willis		x						
4	1	Environment testing with analytical and subjective tracing to determine subjective and flavor effects. (Marlboro)	M. Garrett		x						
4	2	Subjective based recommendations	V. Willis/ K. Deane			x					
5	1	Environment testing with analytical and subjective tracing to determine subjective and flavor effects of products with carbon in filters	M. Garrett		x						
5	2	Subjective based recommendations	V. Willis/ K. Deane			x					

Group Resource Allocation Summary

Individuals	Man-Years	Individuals	Man-Years	Individuals	Man-Years
V. Willis	0.10	Panel	1.10		
P. Thomas	0.10	K. Deane	0.10		
M. Garrett	0.10	D. Wittkamp	0.03		
B. Demian	0.05				

R&D Support Resources (Type of Support)	Division	Man-Years
Cigarette Production	Semiworks	
Analytical analysis	CTSD/ARD	
Subjective evaluation	Semiworks	

2021385972

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992-1996 Five Year-Plan
Project Summary

Project: Qualification of Waterborne Inks

Category: Quality/Cost **Included in 1991-1995 Plan:** G7

Start Date: 1/1/92 **Completion Date:** 4th Quarter 1993

Project Objective: To qualify a waterborne ink system for use on printed packaging material.

Background: Waterborne inks are becoming more appealing because of the lower solvent content in these inks. Waterborne lacquers are currently used on FTB blanks and on cartons. Waterborne inks will help with fast flow inventory.

Benefits/Risks: The major benefits for this program are lower cost, ability to use packaging material for fast flow inventory and meeting environmental regulations. Risks include unacceptable subjectives and printing.

Project Leadership Department: R&D **Group:** Packaging Studies
Program Leader: B. Mait **Man-Years:** 0.8

External Support	1992 Man-Years
Purchasing Technical Services (J. Stargardt)	0.25

BUDGET:
SW Tobacco _____ **POL Testing** _____ **Materials** _____
Other (Specify Type) _____

Project Strategies:

#		Target Completion Dates																			
	Year	1992				1993				1994				1995				1996			
	Qtr.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Support vendor qualification				x																
2	Partner with ink company	x																			
3	Develop specifications								x												

2021385973

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992 Operational Plan
Project Summary

Project: Qualification of Waterborne Ink	Oper. Plan No.:
Major Program Name: Existing Product Support	Date Prepared: 8/13/92
	Prepared By: B. Mait
	Start Date: 1/1/92
Strategic Goal: 1. Support	Completion Date:

Strategy #	Tactic #	Project Tactics	Responsible Person(s)	1992 1	1992 2	1992 3	1992 4	1993 1	1993 2	1993 3	1993 4
1	1	Develop Analytical Procedure	B. Mait							x	
1	2	Determine threshold levels of solvents	T. Cravotta				x				
2	1	Partner with ink company	R. Dunaway	x							
	2	Qualify material on as-requested basis									x
3	1	Recommend ink system specifications	B. Mait								x

Group Resource Allocation Summary

Individuals	Man-Years	Individuals	Man-Years	Individuals	Man-Years
T. Cravotta	0.25	R. Dunaway	0.1		
Solvent Panel	0.1				
Flavor Tech.	0.1				
B. Mait	0.25				

R&D Support Resources (Type of Support)	Division	Man-Years
Analytical Method Development	Analytical Research	0.25

2021385974

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992-1996 Five Year-Plan
Project Summary

Project: Qualification of Offset Inks

Category: Cost/Productivity **Included in 1991-1995 Plan:** E-9

Start Date: 1/1/92 **Completion Date:** 1993

Project Objective: Qualify an offset printing system for use on promotional items and low volume brands.

Background: Offset printing is an economical method for printing small quantities. However, this type of printing can impart unacceptable subjectives. Offset is the printing method of choice for many items and is needed for use on promotional items.

Benefits/Risks: Benefits to this printing include quick turnaround and lower printing costs. Risks include unacceptable subjectives.

Project Leadership Department: R&D **Group:** Packaging Studies
Program Leader: B. Mait **Man-Years:** 0.7

External Support	1992 Man-Years
Purchasing Technical Services (E. Gruca)	0.25

BUDGET:
SW Tobacco _____ POL Testing _____ Materials _____
Other (Specify Type) _____

Project Strategies:

#	Year	1992				1993				1994				1995				1996			
	Qtr.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Support vendor qualification				x																
2	Establish task force for offset printing								x												

2021385975

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992 Operational Plan
Project Summary

Project: Qualification of Offset Printing System

Major Program Name: Existing Product Support

Strategic-Goal: 1. Support

Oper. Plan No.:
Date Prepared: 8/13/92
Prepared By: B. Mait
Start Date: 1/1/93
Completion Date:

Strategy #	Tactic #	Project Tactics	Responsible Person(s)	1992 1	1992 2	1992 3	1992 4	1993 1	1993 2	1993 3	1993 4
											x
1	1	Develop analytical procedure	G. Vilcins								x
1	2	Determine solvent thresholds	T. Cravotta								x
2	1	Examine feasibility of low odor offset printing	C. Kroustalis								x
2	2	Examine feasibility of heat set offset printing	C. Kroustalis								x
2	3	Examine feasibility of low odor UV offset	C. Kroustalis								x

Group Resource Allocation Summary

Individuals	Man-Years	Individuals	Man-Years	Individuals	Man-Years
Solvent Panel	0.1	C. Kroustalis	0.25		
Flavor Tech.	0.1				
T. Cravotta	0.25				
B. Mait	0.25				

R&D Support Resources (Type of Support)	Division	Man-Years
Analytical Development	Analytical Research Division	0.2

2021385976

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992-1996 Five Year-Plan
Project Summary

Project: Qualification of New Packaging Material

Category: 1. Quality, 2. Growth **Included in 1991-1995 Plan:** G-8, G-7, E-9

Start Date: 1/1/92 **Completion Date:** 1993

Project Objective: Qualify new packaging material for use in new brands, line extensions, graphics changes and promotional items.

Background: New brands need packaging material qualified before use in the marketplace, threshold levels will also be revised as printing methods change.

Benefits/Risks: Ensure packaging material is subjectively acceptable before introduction into the market.

Project Leadership Department: R&D **Group:** Packaging Studies
Program Leader: B. Mait **Man-Years:** .8

External Support	1992 Man-Years
Purchasing Technical Services	0.25

BUDGET:
SW Tobacco _____ POL Testing _____ Materials _____
Other (Specify Type) _____

Project Strategies:

#	Year	1992				1993				1994				1995				1996			
	Qtr.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Qualify promotional items								x												
2	Qualify new packaging material								x												
3	Revise solvent thresholds to reflect current solvent mixes								x												
4	Develop database			x																	

2021385977

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992 Operational Plan
Project Summary

Project: Qualification of New Packaging Material

Major Program Name: Existing Product Support

Strategic Goal: 1. Quality, 2. Growth

Oper. Plan No.:

Date Prepared: 8/13/92

Prepared By: B. Mait

Start Date: 1/1/92

Completion Date:

Strategy #	Tactic #	Project Tactics	Responsible Person(s)	1992 1	1992 2	1992 3	1992 4	1993 1	1993 2	1993 3	1993 4
1	1	Evaluate analytically	R. Hale								x
1	2	Evaluate subjectively	Solvent Panel								x
2	1	Evaluate analytically	R. Hale								x
2	2	Evaluate subjectively	Solvent Panel								x
3	1	Determine new subjective thresholds	T. Cravotta								x
	2	Correlate subjective thresholds to specifications	T. Cravotta								
4	1	Supply CAD with database specifications	R. Dunaway			x					

Group Resource Allocation Summary

Individuals	Man-Years	Individuals	Man-Years	Individuals	Man-Years
Solvent Panel	0.1	R. Dunaway	0.25		
Flavor Tech.	0.1	B. Mait	0.25		
T. Cravotta	0.1				

R&D Support Resources (Type of Support)	Division	Man-Years
Software development	Computer Applications	0.25

2021385978

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992-1996 Five Year-Plan
Project Summary

Project: PACKAGING SUPPORT AND DEVELOPMENT

Category: QUALITY/ENVIRON./PROD. SUPPORT **Included in 1991-1995 Plan:** _____

Start Date: _____ **Completion Date:** _____

Project Objective: DESIGN AND DEVELOP UNIQUE PACKAGING CONCEPTS THAT ADDRESS THE ISSUES OF QUALITY, ENVIRONMENT, COST AND PRODUCTIVITY. PROVIDE PACKAGING SUPPORT IN THE FORM OF FABRICATION OF ONE-UP PROTOTYPES TO ASSIST IN THE PROCESS OF PRODUCT DEVELOPMENT.

Background: FREQUENT REQUESTS ARE RECEIVED FOR NOVEL PACKAGING CONCEPTS FROM A VARIETY OF CUSTOMERS WITHIN PM. WE HAVE THE CAPABILITY TO PRODUCE HAND MADE MOCK-UPS THAT ALLOWS THE EVALUATION OF PACKAGING CONCEPTS TO PROCEED WITHOUT LARGE EXPENDITURES OF TIME AND MONEY. EVALUATION OF UNIQUE PACKAGING MATERIALS AND FABRICATION METHODS ARE WITHIN OUR CAPABILITY AND ALLOW THE ISSUES OF COST, QUALITY, ENVIRONMENT AND PRODUCTIVITY TO BE ADDRESSED IN AN EFFECTIVE MANNER BY PACKAGING INNOVATION.

Benefits/Risks: REDUCED COSTS OF PACKAGING DESIGN AND DEVELOPMENT. QUICK TURN AROUND TIMES FOR PROTOTYPE DEVELOPMENT AND TESTING. NO CONSTRAINTS IMPOSED BY RELYING ON EXISTING PACKAGING MACHINERY AND TECHNIQUES.
DEVELOPMENT OF PACKAGING MATERIALS AND TECHNIQUES THAT REQUIRE SIGNIFICANT MACHINERY MODIFICATION OR THE DEVELOPMENT OF NEW MACHINERY.

Project Leadership Department: R&D/ENGINEERING **Group:** FILTER TECHNOLOGY
Program Leader: JOHN HEARN/REGGIE NEWSOME **Man-Years:** 1.5

External Support	1992 Man-Years
PURCHASING	
ENGINEERING	

BUDGET:
SW Tobacco _____ **POL Testing** _____ **Materials** $2.8K
Other (Specify Type) MOLDING VENDORS - $20K

Project Strategies:

#	Year	1992				1993				1994				1995				1996			
	Qtr.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	DEVELOP A MOLDED FIBER PACK								X												
2	DEVELOP AN INJECTION MOLDED PACK								X												
3	DEVELOP AN ALL ALUMINUM PACK						X														
4	PARTICIPATE ON THE PACKAGING INNOV. TEAM								X												
5	SUPPORT OF BRAND INTRODUCTIONS								X												

2021385979

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1992 Operational Plan
Project Summary

Project: PACKAGING SUPPORT AND DEVELOPMENT

Major Program Name: FILTER TECHNOLOGY

Strategic Goal: #1 COST/QUALITY, #2 PRODUCT SUPPORT #4 ENVIRON./BIODEGRADABILITY

Oper. Plan No.:
Date Prepared: 8/20/92
Prepared By: JOHN HEARN
Start Date:
Completion Date:

Strategy #	Tactic #	Project Tactics	Responsible Person(s)	1992 1	1992 2	1992 3	1992 4	1993 1	1993 2	1993 3	1993 4
1	1	REVIEW VENDOR CAPABILITIES TO PRODUCE MOLDED FIBER PACKS	R. NEWSOME			X					
	2	PENDING OUTCOME OF TACTIC #1, SECURE CONFIDENTIALITY AGREEMENT WITH VENDOR	"			X					
	3	INITIATE MOLDED PACK DESIGNS	"				X				
	4	VISIT VENDOR TO DISCLOSE DESIGNS & INITIATE DEVELOPMENT EFFORTS	"					X			
	5	OBTAIN PROTOTYPE PACKS, MODIFY DESIGN AS NEEDED	"						X		
	6	MANAGEMENT EVALUATION / CONSUMER TESTING	"							X	
	7	EVALUATE MOLDED FIBER CONCEPT	"								X
2	1	SECURE CONFIDENTIALITY AGREEMENT WITH VENDOR	"				X				
	2	VISIT VENDOR TO DISCLOSE DESIGNS & INITIATE DEVELOPMENT EFFORTS	"					X			
	3	BEGIN MATERIAL DEVELOPMENT IN CONJUNCTION WITH PAPER TECHNOLOGY PERSONNEL	"						X		
	4	PROTOTYPE DEVELOPMENT	"								X
3	1	PREPARE MOCK-UPS FOR FOCUS GROUP TESTING	"				X				
	2	DEVELOP ALTERNATIVE DESIGNS	"				X				
	3	CONTINUE TO SUPPORT PKG. INNOV. TEAM EFFORTS	"						X		
4	1	SUGGEST, DESIGN, IMPLEMENT & TEST PACKAGING CONCEPTS	"								X
5	1	PACKAGING SUPPORT OF BRAND INTRO.- MARL. WIDES	"					X			
	2	PACKAGING SUPPORT OF BRAND INTRO.- RED EXPRESS	"							X	
	3	PACKAGING SUPPORT OF BRAND INTRO.- ROYCE	"								X
	4	OTHER PACKAGING SUPPORT	"								X

Group Resource Allocation Summary

Individuals	Man-Years	Individuals	Man-Years	Individuals	Man-Years
R. NEWSOME	0.5	Z. WASHINGTON	0.2		
J. HALL	0.5	J.HEARN	0.1		
A. GERGELY	0.2				

R&D Support Resources (Type of Support)	Division	Man-Years
CIGARETTE AND PACKAGING FABRICATION	TOB. PROC. & FAB.	
CONSUMER TESTING	PED	
MATERIALS EVALUATION	ARD	
MATERIALS EVALUATION AND PREPARATION	CIGT. TECH.	

2021385980

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

TOBACCO TECHNOLOGY

2021385981

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Tobacco Fundamentals **Program No.:**

Category: Tobacco Technology **Date Prepared:**

Start Date: 1st QTR 1993 **Completion Date:** 1993

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Determine relationships for accurate prediction of	W. Nichols	3.5 RTD (4R3)								
blend performance in a cigarette.										
Examine variation in firmness test	W. Nichols									
Modify CV Tester	W. Nichols									
Compare image analysis to sieves	W. Nichols									
Determine feasibility of 3D imaging for filler shape	W. Nichols									
factor.										
Modifty Model	W. Nichols									
Investigate physical properties for producing lower										
weight cigarettes.										
Establish component survivability at maker	W. Nichols									
Define modulus of elasticity for components	S. Ganeriwala									
Determine impact of size on weight S.D.	W. Nichols									
Develop an integrated program for economic	W. Nichols									
scenario analysis										
Define an integrated system structure	W. Nichols									
Communicate with associated departments	W. Nichols									
Support Cigarette Design Model	W. Nichols									
Define tar mixing law on TLA data	W. Nichols									
Define TLA test methods for filling power	W. Nichols									
Develop process modeling capabilities for	W. Nichols									
Process Development.										
Acquire Simons software for BL Process	W. Nichols									
Produce cost and scale-up scenarios	W. Nichols									
Expand model for rheology particle size, & tensile	W. Nichols									
Type of Support	**Support Division**	**Mgr.**								
	ARD									
0.5	CAD									
0.75	CTSD									
	PED									
1.0	Semi Works									

2021385982

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 -1997 Five-Year Plan
Program Summary

Program: Tobacco Fundamentals

Category: Tobacco Technology **Included in 1992-1996 Plan:** _____

Start Date: 1st QTR 1993 **Completion Date:** 1993

Program Description: Develop modeling tools for evaluating cigarette and process performance.

Importance to PM-USA: Permits accurate economic evaluation for financial decision making resulting in cost and competitive advantage.

Program Benefits: Provides the knowledge base to reduce cigarette weight at satisfactory firmness.

Program Leadership:
Functional Area: R&D **Department:** R&D **Program Leader:** W. Nichols

Support Required From 1993 Man-Years Leadership Dept. (93)

Capital Requirements (93) $ _____ **1993-1997** $ _____ **650 Timing** _____

Program Milestones	1993				1994				1995				1996				1997			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Determine relationships required for accurate prediction of blend performance.																				
Investigate physical properties of tobacco for producing lower weight cigarettes.																				
Develop an integrated program for economic analysis.																				
Develop process modeling capacilities for Process Development.																				

2021385983

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 - 1997 Five-Year Plan

Program Summary

Program: Tobacco Technology
(Fundamental Determinants of Filling Power)

Start Date: 4 Jan 1993 **Completion Date:** 31 Dec 1994

Program Description: The identification of factors important to maintenance of filling power of untreated tobacco shreds, treatment of expanded material so as to prevent collapse during subsequent processing, and acceptable chemical measures that "stiffen" shreds in the cigarette. Special emphasis will be given to the "Brica" blend. Since a great deal of work has already been devoted to this topic, a thorough and critical review of those results is essential. To a significant degree, this sub-program is a re-initiation of previous efforts, the review of which ought to produce a cogent model.

Importance to PM-USA: Provides ability substantially to reduce tobacco weight in the cigarette, while maintaining subjective acceptability. Central to improved tobacco utilization.

Program Benefits:

1. More effective use of available tobacco in the delivery of designated tar.
2. Diminish tar delivery while reducing sidestream smoke.
3. Provides means of realizing financial savings.
4. Facilitates reduction of puff count in Project Tomorrow.
5. Supplements of expansion as means of increasing filling power.

Tobacco Technology	Support Required From	1993 Man-Years
Tobacco Physics		1
Tobacco Chemistry/Biochemistry		1
Technician		0.5
	Analytical Research Division	0.25
	Process Engineering (Pilot Plant)	0.2
	Semiworks	0.1

Program Milestones:	1993	1994	1995	1996	1997
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
1. Critically evaluate literature.	---				
2. Determine mechanism of post-expansion collapse. Test effect of varying surface tension and polarity of reordering matrix.	------				
3. Determine mechanical effects (stress-strain relationships) of interactions of tobacco type, temperature and water content in treated- and untreated tobacco materials.	---	----------			
4. Identify and test tobacco-identical "chemical stiffening" agents (especially calcium salts-sucrose mixtures) using					
a. Bright tobacco	--------				
b. Burley tobacco, other blend components	-------	----			
5. Pending successful outcome of Part ~~3~~ 4 above, identify those tobacco components that participate in stiffening, and define the means of achieving optimum reaction.		----------			
6. Establish effects of expansion upon tobaccos treated in such ways.		-------			
				PAGE 1 of 6 PAGES	

2021385984

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 - 1997 Five-Year Plan

Program Summary

Program: Tobacco Technology
(Tobacco Flavor Transfer)

Start Date: 1 Jan 1993 **Completion Date:** 31 Dec 1995

Program Description: This sub-program seeks to achieve desired smoke flavor characteristics by manipulating the tobacco component. Traditionally, tobacco flavor has been inextricably linked to tobacco filler. We intend a radical departure from that restrictive tradition by "decoupling" flavor from filler. To do so we must (a.) develop processes to restore (or enhance) tobacco flavor in processed or neutral" filler; and (b.) isolate and quantify sensorially important tobacco components. A database of linked tobacco properties and subjective performance will be accumulated during the investigation.

A closely related topic included is the isolation and identification of the subjectively important sensory components developed during the BL process. RCB notes are important to Marlboro performance; their chemical basis must be understood.

Importance to PM-USA: Success would enable treatment of tobacco to achieve maximum filling power without fear of subjective degradation, use of inexpensive tobaccos. Separate application of tobacco flavors to neutral filler can provide a truly homogeneous cigarette to the consumer. We ought to be able to answer the query "What is good tobacco?" in a chemically meaningful manner.

Program Benefits: Effectively maximizes flexibility of tobacco utilization by separating flavor considerations from physical considerations. Selected flavor components of identified properties likely to be useful for unconventional cigarette designs. "BL-in-a-bottle" for application where needed.

Tobacco Technology	Support Required From	1993 Man-Years
Chemistry (natural products)		2
Technician (chemistry)		1
	1. Smoking panel	0.1
	2. Analytical Research Division	0.25
	3. Leaf Department	0.1
	4. TQAF	0.1
	5. Process Engineering	0.1
	6. Computer Applications Division	0.1

Program Milestones:	1993				1994				1995				1996				1997			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
A. Acquire flavors from tobacco:																				
1. Develop extraction process to acquire "tobacco flavor" (TF) from tobaccos noted (Leaf) for valuable subjectives, and analytical method to monitor process.	------																			
2. Develop method to re-apply TF to appropriate substrate.			---																	
3. Examine other tobacco sources of desirable flavors available at commercial scale. Smoking panel to evaluate				---																
B. Isolate and quantify TF:																				
1. Develop a "neutral" cigarette" model	---																			
2. Evaluate and choose methods for TF acquisition (solvent extraction, SCFE).	----																			
3. Fractionate extracts by established methods, with sensorial guidance.			------																	

2021385985

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 - 1997 Five-Year Plan

Program Summary

Program: Tobacco Technology
(Tobacco Flavor Transfer)

Start Date: 1 Jan 1993 **Completion Date:** 31 Dec 1995

Program Description: This sub-program seeks to achieve desired smoke flavor characteristics by manipulating the tobacco component. Traditionally, tobacco flavor has been inextricably linked to tobacco filler. We intend a radical departure from that restrictive tradition by "decoupling" flavor from filler. To do so we must (a.) develop processes to restore (or enhance) tobacco flavor in processed or neutral" filler; (b.) isolate and quantify sensorially important tobacco components; and (c.) develop a database of linked tobacco properties and subjective performance.

Importance to PM-USA: Success would enable treatment of tobacco to achieve maximum filling power without fear of subjective degradation, use of inexpensive tobaccos. Separate application of tobacco flavors to neutral filler can provide a truly homogeneous cigarette to the consumer. We ought to be able to answer the query "What is good tobacco?" in a chemically meaningful manner.
Essential to "Best Flavor at Maximum Cigarette Yield".

Program Benefits: Effectively maximizes flexibility of tobacco utilization by separating flavor considerations from physical considerations. Selected flavor components of identified properties likely to be useful for unconventional cigarette designs.

Tobacco Technology	Support Required From	1993 Man-Years
Chemistry (organic)		3
Chemistry (analytical)		1
Chemistry (general)		1
Technician (chemistry)		2
	1. Smoking panell	0.1
	2. Analytical Research Division	0.25
	3. Leaf Department	0.1
	4. TQAF	0.1
	5. Process Engineering	0.1
	6. Computer Applications Division	0.25

Program Milestones:	1993	1994	1995	1996	1997
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
A. Acquire flavors from tobacco:					
1. Inventory and catalog sources of tobacco flavor (OTM, dust, scrap).	---				
2. Develop extraction process to acquire "tobacco flavor" (TF) from a substrate, and analytical method to monitor process.	---				
4. Develop method to re-apply TF to appropriate substrate.	---				
5. Systematically survey TF from 1., above. Smoking panell to evaluate.	---				
B. Isolate and quantify TF:					
6. Develop a "neutral" cigarette" model	---				
7. Evaluate and choose methods for TF acquisition (solvent extraction, SCFE).	----				
8. Fractionate extracts by established methods, with sensorial guidance.	------				

2021385986

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Program Milestones:	1993	1994	1995	1996	1997
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
9. Determine method and levels for adding TF fractions onto neutral cigarette models (6., above).	---				
10. Assemble and train smoking panel. Develop smoking protocol.	---				
11. Monitor fractionation (8., above) using GC, LC or both.	------				
12. Identify components of flavorful fractions using suitable methods (e.g. MS, NMR, IR, UV).	---	----------			
13. Develop methods to quantify the identified components.		-----			
14. Use the newly acquired methods to characterize burley, bright and oriental tobaccos, and novel tobaccos acquired through "Global Tobacco Profiling".		----------	----------		
15. Continuous smoking panel activity.	---	----------	----------		
C. Establish linked database:					
16. Design and implement comprehensive database scheme.	------				
17. Continuously collect and collate chemical and related subjective data.		----------	----------		

2021385987

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 - 1997 Five-Year Plan

Program Summary

Program: Tobacco Technology
(Global Tobacco Profiling)

Start Date: 1 Jan 1993 **Completion Date:** 31 Dec 1995

Program Description: Systematic survey of off-shore and unfamiliar domestic tobaccos and practices, seeking advantages in cost, processability, flavor, impact and specific smoke components. Information acquired to be organized so as to link smoke, subjectives, processability and yield with variety identity, region of growth, agronomic conditions and practices. Harmonize information with existing TLA database.

Importance to PM-USA: Potential reduction of tobacco cost without degradation of physicals and subjectives. Opportunities for TSNA reduction before purchase. Unusual tobaccos for unconventional cigarette designs (e.g. high nicotine contents).

Program Benefits: Acquisition of this knowledge will facilitate choice of tobaccos on the basis of cost alone, trait alone or both, and will enhance predictability of performance.

Tobacco Technology	Support Required From	1993 Man-Years
1. Tobacco agronomy		0.5
2. Tobacco chemistry/biochemistry		0.5
	1. Leaf Department	0.2
	2. Smoke Technology	0.25
	3. Analytical Research Division	0.5
	4. TQAF	0.2
	5. Semiworks	0.2
	6. PM Europe (TSNA analysis)	0.2
	7. Smoking Panel	0.1
	8. Computer Applications Division	0.1
	9. CTSD	0.25

Program Milestones:	1993	1994	1995	1996	1997
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
1. Confer with Leaf, IOS to identify sources of tobaccos, potential characteristics, costs. Acquire tobaccos.	--------				
2. Perform TLA-type analyses, other chemical analyses (CPA, TSNAs, etc.) done or developed as appropriate. Access existing TLA database.	-----	--------			
3. Evaluate processing survivability, filling power, other physicals.	--	--------	--		
4. Evaluate subjectives as single component and in blend.	--	--------	--		
5. Characterize mainstream and side-stream smoke.	--	--------	--		
6. Conduct data analysis and interpretation.	--	--------	----		
7. Catalog data linking tobaccos, costs, smoke, subjectives and processability.		--	--------		

2021385988

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 - 1997 Five-Year Plan

Program Summary

Program: Tobacco Technology
(Fundamental Aspects of Processing)

Start Date: 1 Jan 1993 **Completion Date:** 31 Dec 1993

Program Description: This sub-program is directed toward:

a. acquiring fundamental knowledge about the release of pectin from tobacco materials, and about the mechanisms of its reassociation with the tobacco cellulosic matrix;

b. identifying and exploiting the subjectively important sensory components developed during the BL Process.

Because of the impending introduction of NBL into the BL Plant, there is some urgency to this effort.

Importance to PM-USA: A better understanding of the chemical and physical mechanisms of pectin extraction and BL sheet formation will facilitate modification of the process for economic and subjective reasons. RCB notes are important to Marlboro performance; their chemical basis must be understood.

Program Benefits: Speed-up of the BL Plant. Introduction of NBL. "BL-in-a-bottle" for application to non-BL blend components.

Tobacco Technology	Support Required From	1993 Man-Years
Chemistry (natural polymer)		1
Chemistry (organic)		1.75
Chemistry (analytical)-GC/MS		0.5
Technicians (chemical)		2
	1. Smoking panel	0.1
	2. Development Engineering	0.2
	3. Analytical Research Division	0.2
	4. Pilot Plant	1

Program Milestones:	1993	1994	1995	1996	1997
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
1. Alternate modes of pectin release	---				
2. Mechanisms of pectin/tobacco matrix reassociation.	------				
3. Evaluate European feedstocks regarding pectin release, reassociation.	---				
4. Isolate and characterize sensory components of RCB sheet.	---				
5. Isolate and characterize chemical precursors of sensory components in NBL feedstocks, slurry.	------				

2021385989

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 - 1997 Five-Year Plan

Program Summary

Program: Tobacco Technology
(Stabilization and Storage)

Start Date: 1 Jan 1993 **Completion Date:** 31 Dec 1994

Program Description: The issues addressed by this sub-program are two-fold:

a. develop a fundamental understanding of the mechanisms of self-heating and darkening of BL, and recommend modifications of formulation, storage, or both so as to minimize these phenomena;

b. identify chemical correlates of thermal damage in packaged cigarettes (e.g. carbon dioxide production), determine their association with subjective failure, and devise readily apparent indicators of such damage at retail.

Importance to PM-USA: (a.) Loss of post-production BL in warm seasons and climates at unpredictable frequencies. Solution of this nuisance will benefit our International affiliates, and may facilitate storage in PM-80 boxes. (b.) Development of indicators of thermal damage in retail chain may reduce customer complaints.

Program Benefits: (a.) Eliminate subjective degradation and loss of BL due to darkening. (b.) Better quality at retail; potential reduction of customer complaints recorded as "stale"; possible contribution to chemical and sensory understanding of "stale". Reduce the role of the consumer as biosensor of quality deficiencies.

Tobacco Technology	Support Required From	1993 Man-Years
Tobacco biochemistry		1.5
Chemistry (general)		0.5
Technician (biochemistry)		1
	1. Smoking panel	0.2
	2. Analytical Research Division	0.5
	3. Machine shop	0.1
	4. CTSD	0.2

Program Milestones:	1993	1994	1995	1996	1997
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
A. Self-heating of BL					
1. Establish relationships among oxygen and sugars consumed, and carbon dioxide produced, using RCB and NBL.	---				
2. Identify the mechanisms of carbon dioxide production (oxygen-dependent and -independent) by RCB and NBL.	---------				
3. Determine time-course and temperature dependency of carbon dioxide production, sugar loss, oxygen consumption by bright, burley, oriental, ES, ET, RL and BL feedstocks.	------				
4. Modify NBL formulation and measure O2/CO2/sugars, self-heating in PM-80 boxes.	------				
5. Conduct subjective evaluations of models showing different levels of self-heating (vary storage periods).	------	----------			
6. Field studies with Quality Engineering (storage) anticipated.		----------			

2021385990

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Program Milestones:	1993	1994	1995	1996	1997
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
B. Indicators of thermal damage					
7. Identify contribution of each blend component to CO2 production.	---				
8. Establish time-temperature profile of CO2 production by selected blends.	------				
9. Correlate CO2 accumulation, changes of moisture with subjectives (stale?).	---------				
10. Design, construct and test shipping containers to measure CO2 accumulation.	-----				
11. Field evaluation of containers.		--------			
12. Examine heat-damaged fillers for other chemical changes; correlate with CO2 production.	------	-------			
13. Develop in-pack indicator of extent of CO2 production and maximum temperature reached. Implement and test in the field.		------			

2021385991

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

SMOKE TECHNOLOGY

2021385992

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Smoke Technology **Program No.:**

Category: Product Development **Date Prepared:** 8/27/92

Start Date: 1/93 **Completion Date:** Ongoing

Program Milestones	Responsible Person	Resource Allocation	1993 1 2 3 4	1994 1 2 3 4
Develop Methods for smoke generation/collection		1.8		
Develop methods for smoke analysis		1.7		
Develop Internal Data-/Knowledge- base & interpretation methods		1.3		
Establish, train and utilize subjective capability		1.0		
Sidestream Smoke ODOR		2.7	Ongoing	
Sidestream Smoke IRRITATION		11.2	Ongoing	
Sidestream VISIBILITY		0.2	Ongoing	
Support Project Tomorrow		4.0		
Support smoke characterization of novel smoking articles		4.5	Ongoing	
Nicotine deliverly/transfer; hight taste; low tar		1.1		

Type of Support	Support Division	Mgr.
	ARD	
	CAD	
	CTSD	
	PED	
	Semi Works	

2021385993

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

D. Leyden

PHILIP MORRIS U. S. A.

INTER-OFFICE CORRESPONDENCE

Richmond, Virginia

To: Dr. Donald Leyden

Date: August 27, 1992

From: Harvey Grubbs

Subject: 1993 Operational Plans for Smoke Research/Technology

Objective/Mission Statement

Identify the critical factors necessary to support the development of new products through the measurement and characterization of cigarette smoke and its relationship to cigarette design and consumer acceptance.

Background

This program is being structured to have the capability of characterizing the mainstream and sidestream smoke of any type of cigarette product. Characterization includes determining the analytical, physical, and subjective properties of smoke. All of the appropriate data is to be centralized in a database which will provide a complete record of the design and performance of each sample. The database is the cornerstone of a knowledge base to be built upon the relationships between design and performance characteristics. The value of this program will be its ability to answer the questions of how consumer, manufacturing, regulatory, quality and cost issues affect the products we produce.

The vision for this program is an ambitious one. Ultimately, it will provide a vehicle for evaluating the performance of any cigarette design. This can only be accomplished through the systematic accumulation of a body of data and the reduction of this data to a body of knowledge. But, to provide an immediate resource, the initial strategies of the program are directed toward supporting the existing R&D programs. Through this support, the accumulation of information required will begin with contributions to the more immediate needs of our Company.

2021385994

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Based on this concept, the following strategies are proposed for 1993.

I. Smoke generation/collection/analysis/characterization

II. Internal database/knowledge base and interpretation

III. Dedicated subjective capability

IV. Sidestream odor/irritation/visibility

V. Tomorrow

VI. Novel smoking articles

VII. Nicotine delivery/transfer/high taste/low tar

2021385995

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Strategy I. SMOKE GENERATION/COLLECTION/ANALYTICAL/CHARACTERIZATION

Rationale: A variety of smoke generation and collection methodologies, and analytical techniques have been previously utilized for smoke characterization. Development of real-time smoke analysis techniques will provide for correlation of measured physical and chemical properties with subjective evaluations of the smoke. Integration of the various analytical techniques into a single structural characterization laboratory would similarly result in more efficient and effective smoke evaluation.

Generation of MS smoke from many types of cigarettes is readily accomplished at the present as is generation of SS for visibility measurement and measurement of SS TPM, CO, CO_2 and hydrocarbons ("CORESTA data"). Methods necessary for labelled tracer studies (total recovery smoking machines) are also available. Analytical techniques for the qualitative evaluation for gas phase, organic gas phase and particulate material by GC with nitrogen, sulfur and oxygen selective detection (oxygen detectors due online by the end of 1992), FTIR and GC/MS have been developed. Literature reports of sidestream studies indicate that various analytical methods are amenable to application as real-time detectors for MS smoke.

Strategy Number 1. Generate, collect, analyze, and characterize mainstream (MS) and sidestream smoke (SS) from any smoking article; ensure that the appropriate methods for such activities are developed and available.

Tactics and Timetable

1. Smoke Collection/Generation

   a. Refinement of MS smoke generation methods for novel smoking articles 1 qtr. 93

   b. Improved methods for generation and collection of SS smoke for odor/irritation studies 2 qtr. 93

      NOTE: This research must be closely coordinated with the development of the dedicated subjective capability

   c. Appropriate delivery and visual measurements of MS with altered smoke presentation/deposition patterns 3 qtr. 93

2021385996

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

2. Smoke Analysis

a. Initiate development of real-time smoke generation/analysis capability (no pretrapping devices)

i. Evaluate atmospheric pressure ionization mass spectrometry, ion mobility spectrometry, particle beam mass spectrometry, direct online GC sample introduction 4 qtr. 93

ii. Determine if need exists for real-time smoke analysis by techniques other than FTIR and mass spectrometry (i.e., uv spectroscopy, fluorescence spectroscopy, refractive index) 4 qtr. 93

b. Develop highly sensitive capability for determination of chemical composition of fresh smoke on a single puff basis 3 qtr. 93

c. Evaluate the extraction efficiency of supercritical fluid extraction for polar smoke components for automation of TPM fractionation method 2 qtr. 93

d. Develop methods for measuring the physical properties of the smoke aerosol

i. Initiate study of the relationship of particle size and chemical composition. Determine most sensitive size separation methods compatible with qualitative evaluations of the particles 4 qtr. 93

ii. Conduct literature study to determine state-of-the-art techniques for single particle analysis 4 qtr. 93

e. Develop appropriate measurements of time-temperature-space profile of burning coal in a cigarette 4 qtr. 93

2021385997

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Strategy II. INTERNAL DATABASE/KNOWLEDGE BASE AND INTERPRETATION

Rationale: Develop databases which will provide (directly or by software linkage) detailed cigarette construction parameters, results of physical and chemical evaluation, results of subjective evaluation and references for experimental details for all samples analyzed.

Existing databases (Semiworks) and database construction already underway for other groups in R&D (CTSD) will be in part applicable to the needs of the Smoke Research Group. Also, there are other PM U.S.A. databases (TLA) which may be accessible for information about tobaccos utilized in model cigarette construction.

Strategy: Evaluate the effects of the cigarette design on the analytical, physical, and subjective character of smoke.

Tactics and Timetable

1. Design Smoke Research Group database. 1 qtr. 93

2. Create the Smoke Research Group database

   a. Links to existing databases 2 qtr. 93

   b. Completed 3 qtr. 93

3. Develop relationships and correlations among novel filters, tobacco rod density, paper permeability, or banded wrappers and smoke characteristics 4 qtr. 93

4. Provide Cigarette Design Project with knowledge base for modelling applications 4 qtr. 93

2021385998

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Strategy III. DEDICATED SUBJECTIVE CAPABILITY

Rationale: A dedicated subjective capability is a requirement for success in the goals of the Smoke Technology program. Analytical measurements are meaningless without the ability to correlate them to subjective evaluations on identical cigarettes. Cigarettes must be evaluated which may not have product potential to obtain the necessary changes in smoke composition to assure a valid correlation.

Strategy: Establish a subjective capability within the Smoke Technology program to permit the subjective evaluation of cigarettes undergoing analytical testing.

Tactics and Timetable:

1. Along with PED, establish subjective descriptors suitable for planned studies on SS and MS smoke. 1 qtr 93

2. PED personnel to train subjective panel members drawn from within the Smoke group. 2 qtr 93

3. Utilize and continue to improve the subjective capability so that subjective evaluations may be compared to analytical results in a timely manner, and using smoking articles designed for the investigations. Ongoing

2021385999

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Strategy IV. SIDESTREAM ODOR/IRRITATION/VISIBILITY

Rationale: The sidestream smoke strategy is divided into three separate areas to address issues of sidestream irritation, odor and visibility. The strategy for visibility primarily consists of continuing support for the Paper Technology Program. The plans for irritation and odor define the needs for the acquisition of fundamental knowledge necessary to move forward with new product development. The three programs appear on the surface to be distinct and to separately pursue their own objectives. However, it is important to stress the interdependency of each to the others in order to meet the overall objective. There should be frequent interaction between all activities including subjective, analytical and cigarette design to share data and information. For example, a low sidestream cigarette model with a new paper can be evaluated not only for its effect on visibility reduction, but also for its effect on irritation and odor. This kind of interaction would allow assessment of the possibility for development of a product with the combined attributes of reduced irritation, low odor and decreased visibility.

A. SIDESTREAM ODOR

Strategy Number 1. Develop a subjective definition (or subjective descriptors) of the meaning of sidestream odor to the consumer.

Tactics and Timetable

1. Conduct a review of the technical literature, PED consumer surveys and in-house data to ascertain the current state of knowledge as it relates to sidestream odor. 1 qtr. 93

2. Define the subjective differences between fresh and aged sidestream smoke to establish the time scale over which the change of odor occurs and explore the effects of oxygen and pH on the subjective characteristics of sidestream smoke. 3 qtr. 93

3. Define subjectively the meaning of room or lingering odor and investigate the effects of sidestream smoke on room characteristics. 2 qtr. 93

4. Establish if a differentiation, if any, exists between ashtray odor and room (lingering) odor. 2 qtr. 93

5. Evaluate the roles of the gas and particulate phases of sidestream smoke as they relate to their contribution to sidestream smoke odor. 4 qtr. 93

2021386000

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

6. Define conditions necessary for consistent odor generation to facilitate the analytical study. 1 qtr. 93

7. Review and relate to the odor issues any data generated in the sidestream irritation plan. 4 qtr. 93 and continuing

Strategy Number 2: **Develop analytical methodology integrated with subjective odor evaluation to attempt to identify compounds that are significant contributors to sidestream smoke odor.**

Tactics and Timetable

1. Devise suitable sampling methods to collect the matrix containing odor characteristic compounds. 1 qtr. 93

2. Design a fractionation protocol, guided by odor evaluations, to locate those fractions most likely to represent the sidestream odor. 3 qtr. 93

3. Use multidimensional gc/ms in conjunction with organoleptic evaluations to analyze the odor contributing fractions from 2.2. Rank the components in each fraction by their odor threshold and identify those with the lowest threshold. 4 qtr. 93

4. Conduct a dose response study based on the results determined in 2.3. 4 qtr. 93

Strategy Number 3: **Design methodologies to assess the feasibility of reducing and/or masking the chemical compounds determined to be responsible for sidestream smoke odor.**

Tactics and Timetable

1. Review the methodologies used in the sidestream smoke irritation operational plan and assess the effects of these methodologies on addressing the issue of sidestream odor-contributing compounds. 4 qtr. 93 and continuing

2021386001

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

B. SIDESTREAM IRRITATION

Strategy Number 1: **Develop subjective assessment tools to measure eye and nose irritation to the smoker and/or non-smoker from the fresh, concentrated sidestream plume.**

Tactics and Timetable

1. Develop a reproducible test to measure sidestream irritation as it relates to the smoker. 1 qtr. 93

2. Review and evaluate the current state of sensor technology with particular emphasis on the capability to "sense" those compounds in cigarette smoke reported to be irritants. 2 qtr. 93

3. Initiate studies to evaluate the potential use of gas sensors as tools in the study of the irritation of sidestream smoke. 4 qtr. 93

4. Utilize a panel "booth" with controlled conditions of temperature, humidity and air circulation to assess sidestream smoke irritation to the smoker. 2 qtr. 93

5. Determine the optimum method for the generation of fresh sidestream smoke for sensory evaluation. 1 qtr. 93

6. Determine the feasibility of constructing an in-house facility, i.e., eye and nose "sniff-port", to study sensory properties of individual sidestream smoke components. 2 qtr. 93

7. Generate and analyze specific analytical data in relation to information obtained from the previously conducted literature search on known irritants and from external expertise. 2 qtr. 93

8. Evaluate the relevance of literature and analytical data to the actual irritation of sidestream smoke, i.e., is there a group of compounds present above threshold levels or a large number of compounds, none of which are estimated to be present above threshold. Are these materials present in the gas or particulate phases and how are they transported to the subject? 4 qtr. 93

9. Determine the need to design and construct an appropriate facility or identify an appropriate facility to conduct sidestream smoke sensory studies.

2021386002

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1 qtr. 93

10. Utilizing information from the literature and the above studies, generate a list of hypotheses to test the importance of various smoke components and cigarette properties to irritation. Continuing

11. Develop approved methodology for addition of model compounds or select portions, i.e., gas phase of sidestream smoke. 4 qtr. 93

12. Evaluate dose response (concentration effects) to estimate threshold levels of irritants and/or combinations of irritants. 1994

13. Compare the threshold levels of specific compounds against analytically determined quantities for those compounds to arrive at their relative contribution to the overall irritation of smoke. Also, decreasing amounts of smoke may be used directly or after chromatography until threshold levels are reached. 1994

Strategy Number 2: **Develop analytical methodology to determine compositional differences between selected test cigarettes and controls and relate the differences, if possible, to known classes of irritants.**

Tactics and Timetable

1. Design and construct a direct inlet system interface to a CI mass spectrometer to facilitate the instantaneous mapping of the molecular weight distribution of the sidestream smoke plume. 1 qtr. 93

2. Devise and utilize methodology to measure the particle size and determine the thermal properties of the sidestream smoke plume. Construct "profiles" of the sidestream smoke plume to allow comparisons between models of varied construction to attempt to define differences that may relate to sidestream smoke changes. 1 qtr. 93

3. Develop methodology to determine the composition of sidestream gas phase for compounds containing nitrogen, sulfur or oxygen by gas chromatography/mass spectrometry. 3 qtr. 93 continuing

   a. Simultaneously analyze sidestream smoke from selected cigarette models for sulfur and nitrogen containing compounds using a Sulfur Chemiluminescence Detector (SCD) in tandem with a Nitrogen-Phosphorus Detector (NPD). Total analysis capability

2021386003

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

requires data collection, data reduction, statistical evaluation and compound identification.

b. Analyze sidestream gas phase for oxygen-containing compounds, including ketones, aldehydes, acids and alcohols by an Oxygen-selective Flame Ionization Detector (O-FID) and/or by the use of an Atomic Emission Detector (AED). An AED would permit the analysis of oxygen containing materials as well as compounds containing a number of other elements.

   i. This requires the evaluation of the performance of O-FID at the vendor's laboratory using smoke extracts. This has been done but results have not been obtained. If the results are acceptable, the purchase of this detector will be recommended.

   ii. Conduct smoke analyses of model cigarettes, data collection, analysis and interpretation.

4. Determine the effect of inorganics in paper (including fillers and fluxing agents) on sidestream smoke chemical compositions and sensory properties by evaluating low sidestream models made with wrappers containing these fillers. An AED could be of use here in determining the transfer of inorganics to smoke.
   2 qtr. and continuing

5. Determine the effects of the thermal properties of the smoke plume on the chemical and sensory attributes of the sidestream smoke. 2 qtr. 93

6. Develop methodology to assess the gas phase/particulate partitioning of compounds that are shown to be irritants in sidestream smoke. Utilize this methodology to determine the effects of temperature and dilution on the delivery mechanisms of the irritants to the subject. 4 qtr. and continuing

<u>Strategy Number 3:</u> **Assess possible methods of reducing the levels of those chemical classes in sidestream smoke which are most likely to contribute to irritation.**

<u>Tactics and Timetable</u>

1. Design and construct a reactor to evaluate thermal and catalytic cracking of sidestream smoke. 2 qtr. 93

2021386004

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

2. Develop model systems to study interactions of specific classes of compounds with selected inorganic materials. 4 qtr. 93

   a. Conduct theoretical modeling of residence time and temperature to determine the required kinetic parameters for a catalysis process. 2 qtr. 93

   b. Conduct a literature search to identify approved materials with reported catalytic properties for destruction of the classes of compounds that are most likely to contribute to irritation. 2 qtr. 93

   c. Evaluate low sidestream fillers, fluxing agents and interaction products of these with each other and with cellulose, e.g., char, for catalytic activity with model compounds representing chemical classes related to irritation. 4 qtr. 93

3. Develop methods to evaluate cigarettes sensorially for irritation and analytically for compositional differences. 3 qtr. 93

4. Prepare low sidestream cigarettes with magnesite, hydromagnesite/brucite and calcium carbonate fillers at optimum reduced visibility levels and evaluate these sensorially for irritation and analytically for compositional differences. 4 qtr. 93

5. Conduct imaging studies on cigarettes incorporating magnesite, hydromagnesite/brucite and calcium carbonate in the wrapper. 4 qtr. 93

6. Identify inorganic materials with potential for catalysis, prepare candidates and evaluate the effect of physical properties, i.e., morphology, particle size, surface area, as well as, chemical and thermal properties on catalytic function. 1994

7. Using model compounds and selected smoke fractions, evaluate catalytic and thermal effects of candidate catalysts under conditions extent in the burning cigarette and characterize products both analytically and sensorially. 1994

8. Evaluate promising catalytic materials in cigarette models subjectively and analytically. 1994

2021386005

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

9. Develop appropriate facilities, methods and protocols to conduct sensory evaluations of products from thermal cracking studies. 1994

10. Evaluate blend additives or changes in blend composition which will reduce irritation while maintaining subjective acceptability. 1995

2021386006

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

C. SIDESTREAM VISIBILITY

Strategy Number 1. **Provide assistance as required in the design, construction and operation of instruments to determine the quantities of sidestream smoke from conventional and low sidestream models.**

Tactics and Timetable

1. Provide the necessary information for the construction of an 8-port visibility monitor at the R&D Facility in Neuchatel, Switzerland. Assist in the construction and instrument check-out as requested. 1 qtr. 93

2. Determine the relationship of sidestream visibility reduction to changes in mainstream subjectives and to changes in sidestream odor and irritation. The appropriate operational plans should be reviewed for addressing this tactic.
1 qtr. and continuing

3. Provide assistance and support to those areas currently using sidestream visibility instruments. Design and construct additional instruments as requested.
continuing

2021386007

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Strategy V. TOMORROW

Rationale: Project Tomorrow has the responsibility of ensuring that all of our domestic cigarettes pass average ignition-propensity standards which may be legislated. This may require our cigarettes to be substantially re-designed in order to meet such standards.

Strategy: Support project Tomorrow in the development of new cigarette designs.

Tactics and Timetable

1. Assess the impact of cigarette design parameters on the deliveries and subjective character.

a. Tobacco rod densities	3 qtr. 93
b. Cigarette permeability	3 qtr. 93
c. Banded wrappers	4 qtr. 93

2021386008

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Strategy VI. NOVEL SMOKING ARTICLES

Rationale: The immediate need of the program is the ability to characterize the composition of the aerosol and relate it to both the design/control parameters and subjective response. Characterization of ther aerosol can consist of a detailed description of the chemical makeup as conventionally done, and/or simply a molecular weight distribution, which has not been done before. This new methodology may also be applicable to the characterization of cigarette smoke which is known to contain macromolecular species (>100,000 Daltons).

A significant difference between the aerosol generated at low temperature and the cigarette smoke is the water content. With a similar nicotine/tar ratio, the nicotine impact and overall response can be significantly higher than expected from the FTC tar delivery. This plan incorporates steps to address the effect of water.

Strategy: Establish the relationships among tobacco thermal history, aerosol composition and the subjective quality of the aerosol generated at low temperature.

Tactics and Timetable

1. Conduct compositional analyses of the aerosol generated at low temperature and relate composition to the thermal history of the aerosol generation matrix.

   a. Use currently available methods to define the chemical composition of the aerosol. 1 qtr. 93

   b. Develop methodology for a more complete and rapid single-puff analysis of the aerosol. 3 qtr. 93

2. Determine the relationship between aerosol composition and subjective response for underheated, properly heated and overheated aerosol generation matrix.

   a. Assess the feasibility of using the molecular weight distribution, particle size distribution or acid/base property of the aerosol as a simple and reliable predictor of subjective quality. 3 qtr. 93

   b. Evaluate the effect of water on the subjective response and the possible synergistic effect with the tar and nicotine delivery. 3 qtr. 93

2021386009

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

c. Separately determine the importance of the volatile distillates and pyrolyzates to subjective response in order to optimize the heating conditions needed to generate subjectively acceptable but chemically simple aerosol.

4 qtr. 93

d. Consult with High Taste/Low Tar program for possible inclusion of its findings in prototype optimization. Continuing

2021386010

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Strategy VII. NICOTINE DELIVERY/TRANSFER; HIGH TASTE, LOW TAR

Rationale: The ability to design cigarettes which are low in tar but rich in flavor and satisfaction has long been a goal of R&D. Systematic investigations aimed toward a practical end point will provide cigarette designers the information needed to accomplish this.

Strategy: Evaluate the effects of cigarette design on the impact of low delivery products. Specifically, determine the effects of blend composition, tobacco and filter additives and cigarette designs on the subjective impact of smoke and the ratio of nicotine to tar.

Tactics and Timetable

1. Review past studies involving filler and filter additives and novel cigarette and filter constructions. 1 qtr. 93

2. Work with the Leaf Department and the Tobacco Technology Group to design blends which have high nicotine-to-tar ratios and incorporate them into cigarettes designed to deliver five milligrams of tar, or less; evaluate the smoke and assess the concept. 1 qtr. 93

3. Work with the Flavor Technology Group to design filler and filter additives which enhance the impact of smoke; incorporate them into ultra-low delivery products and evaluate their smoke. 1 qtr. 93

4. Work with the Filter Technology Group to assess the influence of novel filter materials and constructions on the impact of the smoke from ultra-low delivery products. 4 qtr. 93

2021386011

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Resources

The following personnel and/or expertise would be required to initiate a Smoke Technology/Research Program. Other expertise would be added as the program progressed.

GC, GC/MS, pyrolysis GC/MS	4
HPLC	1
Spectroscopy	1
Aerosol Chemist	2
Radiochemist	2
Computer-Data input	0.5
Data base manager	1
Catalysis Chemist	1
Organic Chemist	1
Inorganic Chemist	1
Subjective panel coordinator	1
Technician	3
Cigarette designer	0.5
Blend designer	0.2
Flavor specialist	0.2
Filter designer	0.2
Panelists (some (all) from members of Smoke Technology)	10

2021386012

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

SENSORY TECHNOLOGY

2021386013

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Sensory Technology **Program No.:**

Category: **Date Prepared:** 8/19/92

Start Date: **Completion Date:**

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Characterization of peripheral nicotine receptors	INBIFO	0.7 RS, 0.7 T								
Development of olfactory & trigeminal systems	INBIFO (extramural)									
receptor assays										
Kinetic effects of nicotine at various pH levels	INBIFO	0.5 RS, 0.5 T								
Effects of nicotine & menthol at different pHs	Hayes, C.	0.1 ASS, 0.3S								
Determine sensory optima for nicotine/menthol										
interactions	INBIFO	0.5 RS, 0.25 T								
Qualify single puff method for smoke "pH"	Lambert, E.	0.1 ASb								
Evaluate single puff smoke "pH" for models	Lambert, E.	0.25 ASb, 0.25T								
Establish EP lab at INBIFO	Gullotta, F.	0.1 RS, .35 T (1)								
Measure nicotine/EP response for cigarettes at										
constant tar & varying nicotine	Gullotta, F.	0.3 RS, 0.3T								
Subjective & sensory EP testing		0.2 RS (3)								
Ca(OH)2 treated filler	Gullotta, F.	0.1 RS, 0.1T								
alternate base treated filler	Gullotta, F.	0.1 RS, 0.1T								
novel blends	Gullotta, F.	0.1 RS, 0.1T								
basified novel blends	Gullotta, F.	0.1 RS, 0.1T								
aerosols as function of [nicotine],	Gullotta, F.	0.2 RS, 0.2T								
pH, buffers, menthol										
Feasibility of aerosol from H2O + spargate	Banyasz, J.	0.15 ASS, 0.15S								
Effect of temperature on performance of novel	Lipowicz, P									
cigarette		0.25 RS, 0.25 S								
Feasibility of tobacco extract enhancement of novel	Lipowicz, P.	0.25 ASS, 0.1RS								
cigarette		0.1 S								
Type of Support	**Support Division**	**Mgr.**								
smoke "pH"; characterization of model cigt.	ARD									
support for collection/analysis of subjective data	CAD									
smoke "pH"; characterization of model cigts.	CTSD									
methods to quantify sensory effects	PED									
production of ~35 cigarette models (2)	Semi Works									
(1) T = electrician, mechanical, etc.;										
(2) some will be joint requests with other programs;										
(3) Flavor Technology - model development										

2021386014

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Summary of Resource Allocations

	Professionals	Technicians
INBIFO	2.2	2.2
CRD	0.35	
BCR	0.3	
CTSD	0.35	
Tech. Assessment	0.15	
PRD	0.85	
FTD	0.5	
TOTAL	**4.70**	**2.2**

2021386015

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

PHILIP MORRIS U. S. A.

INTER-OFFICE CORRESPONDENCE

Richmond, Virginia

To: D. Leyden **Date:** August 20, 1992

From: R. Carchman RC

Subject: 1993 Operational Plans for the Sensory Technology Program

Objective

To develop the technology to produce low alkaloid and low tar/low alkaloid cigarettes (nonmenthol and menthol) that have sensory characteristics superior to currently available products.

Strategy #1

Develop a fundamental understanding of how nicotine affects sensory systems.

Tactics

Characterize peripheral nicotine receptors using known acetylcholine agonists/antagonists. (INBIFO - Complete September, 1993).

Develop receptor assays for olfactory and trigeminal systems. (INBIFO - Complete June, 1993).

Evaluate test compounds which have been determined to be potential sensory substitutes or modifiers for nicotine. (INBIFO, CRD - In progress - Continuing).

Conduct sensory evoked potential and subjective evaluations of promising and acceptable sensory substitutes for nicotine. (INBIFO, CRD - As available).

Investigate the kinetic effects of nicotine at various pH levels. (INBIFO - Complete December, 1993).

Strategy #2

Utilize synergistic interactions between two smoke components (e.g., nicotine and menthol) to produce the cigarettes described in the objective.

2021386016

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Tactics

Investigate the interactive effects of nicotine and menthol.

Conduct mechanistic studies to investigate the interactive effects of nicotine and menthol in order to locate sensory optima. (INBIFO - Complete December, 1993).

Devise and implement an experimental design to evaluate the sensory effects of nicotine and menthol under different pH regimes. (BCR, CRD - Complete June, 1993).

Investigate the influence of possible enhancer compounds (e.g., menthol) and the receptor environment (e.g., pH, ion concentration) on the sensory response to nicotine. (CRD, INBIFO - Begin December, 1993)

Develop sensitive methodology to quantify the sensory effects of cigarettes and components. (PED, BCR - Begin September, 1992 - Continuing as needed).

Strategy #3

Utilize changes in filler pH to produce the cigarettes described in the objective.

Tactics

Evaluate analytical approaches to the measurement of the acid/base character of smoke.

Qualify single puff method for whole smoke, gas phase, and synthetic aerosols (CTSD - Complete January, 1993).

Identify and evaluate alternative relative measures for smoke "pH". (ARD - Complete March, 1993).

Implement analytical approaches to the measurement of the acid/base character of smoke.

1. Cigarettes made from $Ca(OH)_2$ treated filler. (FTD, CTSD, ARD - Complete July, 1993).

2021386017

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

2. Cigarettes made from filler treated with alternate bases. (FTD, CTSD, ARD - Complete September, 1993).

Strategy #4

Conduct subjective and sensory evoked potential (EP) studies to evaluate cigarettes, smoke constituents and tobacco flavorants as provided by PM Richmond.

Tactics

Reestablish the electrophysiological laboratory at INBIFO. (INBIFO - Complete January, 1993).

Develop a nicotine/EP response curve employing cigarettes at constant tar and varying nicotine levels. (INBIFO - Complete May, 1992)

Conduct subjective and sensory EP testing of:

1. Cigarettes made from $Ca(OH)_2$ treated filler. (FTD, INBIFO - Complete July, 1993).

2. Cigarettes made from filler treated with alternate bases. (FTD, CRD, INBIFO - Complete October, 1993)

3. Cigarettes made from filler made with novel blends (FTD, INBIFO - Complete December, 1993)

4. Cigarettes made from filler made with novel blends treated with appropriate bases. (FTD, INBIFO - Begin December, 1993)

Strategy #5

Develop and exchange scientific knowledge on basic and applied aspects of sensory technology.

Tactics

Hold regular Sensory Technology meetings to update program progress, and foster teamwork with respect to relevant sensory issues. (Monthly)

2021386018

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Develop and cultivate relationships with experts in the field of sensory research; invite outside speakers to address sensory issues of relevance to PM business needs. (Ongoing and as needed)

Objective

To develop a flavor delivery system for use in novel cigarettes.

Strategy

Investigate the analytical, subjective, and electrophysiological properties of flavor systems for novel cigarettes.

Tactics

Determine feasibility of making an aerosol with water and spargate. (PRD, Technology Assessment - Complete June, 1993).

Determine effect of temperature on performance of novel cigarettes. (PRD, Technology Assessment - Complete March, 1993).

Determine feasibility of using tobacco extracts to enhance performance of novel cigarettes. (CRD, Technology Assessment, PRD - Complete December, 1993).

Conduct sensory and evoked potential studies on aerosols as a function of nicotine concentration, pH, buffer strength, and menthol content. (INBIFO - Complete August, 1993).

2021386019

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

CONSUMER RESEARCH TECHNOLOGY

2021386020

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Consumer Research Technology **Program No.:**

Category: Address Consumer Desires (Domestic) **Date Prepared:** 8/21/92

Start Date: 1/93 **Completion Date:** 12/93

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Study/Monitor Consumer Issues										
Pilot Smokestyles and issues study	P. Callaham	0.1								
Mail-out/Telephone Smokestyles & Issues Survey	J. Jones	0.3								
Pilot Smokestyles/Portotype Study	P. Callaham	0.1								
Large-scale Smokestyles/Prototype Study	P. Callaham	0.2								
Benefits research among 35+ segment	J. Jones	0.1								
Consumer contact education/communication	P. Callaham	0.05								
Innovator identification/Trend clues	P. Callaham	0.05								
Assess market share trends, demos, etc. of brand	M. Johnston	1.0								
Determine ways to maximize PM's share by segment	M. Johnston	1.0								
Identify forces impacting share in U.S. Market	M. Johnston	1.0								
Generating & Evaluating New Ideas										
Sales Force idea generation/consumer connection	P. Callaham	0.05								
New Packaging Study	J. Jones	0.1								
Brand Family Extensions & Concept Match	J. Jones	0.1								
Multiple Concept/Prototype evaluation by theme	P. Callaham	0.1								
Product Features for Quality & Added Value	P. Callaham	0.1								
Relative value of themes/executions by segment	J. Jones	0.1								
Design-the-ideal methods development	P. Callaham	0.1								
INNOVATION										
Establish group to capture/screen ideas	J. Tindall	0.1								
CONTINUOUS IMPROVEMENT										
Streamline Consumer Testing	F. West	0.1								
Implement Interactive Databases	F. West	0.1								
Convert to SAS software package	M. Ferro	0.2								
Automate data collection for non-panel tests	F. West	0.1								
Type of Support	**Support Division**	**Mgr.**								
	ARD									
	CAD									
	CTSD									
	PED									
	Semi Works									
Prototype Product Samples	Cig. Tech.									

2021386021

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Consumer Research Technology Program No.:

Category: Address Consumer Desires (Domestic) Page 2 Date Prepared: 8/21/92

Start Date: On-going Completion Date: On-going

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Develop Methods to Measure Product										
Benefits versus Sensory Costs										
MAINTAIN KNOWLEDGE BASE										
Tar/Nicotine Consumer Study	M. Fleming	0.05								
Competitive Testing	A. Manwaring	1.0								
Ageing Study	A. Smith	0.05								
Effect of tipping color	M. Fleming	0.05								
COST/BENEFIT										
Sensory cost vs. marketplace purchase	M. Jeltema	0.1								
Cost/benefit response surface	Tindall/Jeltema	0.1								
METHODOLOGY										
Develop panels for										
Smoke & Tobacco Technology	C. Kuesten	2.0								
MODELS TO PREDICT BRAND CHOICE										
Consumer Research Models	D. Ennis	0.5								
Neural Network for brand switching behavior	J. Blankinship	0.3								

Type of Support	Support Division	Mgr.
	ARD	
Neural Network	CAD	
CI Data	CTSD	
	PED	
Cig. Production	Semi Works	
Design Models	Cigarette Testing	

2021386022

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Consumer Research Technology **Program No.:**

Category: Address Consumer Desires (Export) **Date Prepared:** 8/21/92

Start Date: On-going **Completion Date:** On-going

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Study/Monitor Consumer Issues										
Japan: Low smoke/low odor qualitative study	J. Jones	0.1								
Hong Kong: Issues and Concepts Study	J. Jones	0.05								
Consumer Contact Education/Communication	J. Jones	0.2								
Identify Forces that impact share in Asia Markets	C. Matthews	0.4								
Generating and Evaluating New Ideas										
Japan: Low smoke/low odor usage study	C. Matthews	0.1								
Japan: Multiple Concept/Prototype Study	J. Jones	0.1								
Korea: Multiple Concept/Prototype Study	J. Jones	0.1								
Korea: Product Parameters influencing softness	C. Mattews	0.05								

Type of Support	Support Division	Mgr.
	ARD	
	CAD	
CI Data	CTSD	
	PED	
Cig. Production	Semi Works	
Prototype Development	Cig. Technology	

2021386023

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

NEW PRIMARY PROCESS

2021386024

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 -1997 Five-Year Plan
Program Summary

Program: New Primary Process

Category: Cost/Productivity **Included in 1992-1996 Plan:** No

Start Date: January, 1992 **Completion Date:** December, 1994

Program Description:
Develop primary processing toolbox technologies which can be used to meet the business needs for the next 20 years. Specifically, the program will define:
1. Equipment and process requirements for a new facility.
2. New technologies that can be retrofitted to existing facilities.
3. Low capital cost process suitable for international operations.

Importance to PM-USA:
1. Improved profit margins through lower leaf cost/1000 and increased yield/lb tobacco.
2. Improved ability to efficiently process complex brand mixes and order quantities in a single primary.
3. Ability to expand a primary as the business grows in small rather than large capacity increments.
4. Better understanding of cigarette subjectives as a function of processing conditions.

Program Benefits: Discount brands initially:
- 8%-13% tobacco usage reduction (60-100 mg)
- $0.22-$0.35/1000 leaf cost savings
- Cigarette Design Information

Premium brands will follow:
- Similar Technologies
- Similar Benefits

Program Leadership:
Functional Area R&D **Department:** Proc. Dev. **Program Leader:** S. E. Clark

Support Required From	1993 Man-Years	Leadership Dept. (93)
Engineering	2.8	
Operations Services	0.5	
Quality Assurance	0.3	
CEFA/PPE	0.1	
Leaf	0.1	
R&D		17.6 (App'd)

Capital Requirements (93) $ 1.695 mil 1993-1997 $ TBD 650 Timing 3 Q 92

Program Milestones

	1993				1994				1995				1996				1997			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
NPP Process Definition and Design for 60 mg lighter cigt.:																				
BRICA																				
Marlboro																				
Design for 100 mg lighter cigarette:																				
BRICA																				
Marlboro																				
Technology Integration																				

2021386025

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: New Primary Process **Program No.:**

Category: Cost/Productivity **Date Prepared:** 8/92

Start Date: 1/92 **Completion Date:** 12/94

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Define Burley Casing System	Cox/Pitts									
BRICA										
Marlboro										
Other Brands										
Define Flavor System	Cox/Pitts									
BRICA										
Marlboro										
Other Brands										
Cigt. Design/Subj. Parity - 60 mg less wt	Spielberg/Rockwell/									
BRICA	Baldwin/K. Newman									
Marlboro	M. Jeltema									
Other Brands										
Cigt. Design/Subj. Parity - 100 mg less wt	Spielberg/Rockwell/									
BRICA	Baldwin/K. Newman									
Marlboro	M. Jeltema									
Other Brands										
Define Cutting/Steaming/Drying Operation	Crump/Nepomuceno									
Superheated Steam/KLK										
Non-Degrading										
Define NPP Process for Maximum Blend FV	Mullins/Lisbon									
BRICA										
Marlboro										
Other Brands										
Define In-Line Component SCI Process	Dobbs/Wood									
Define RF Filler Heating Process	Wood/Howell/Carboni									
Define Filler Delivery System	Maher									
Define NPP Protos Modifications	Carboni									
Complete Subjective Mapping Database	Ennis									
Complete Process Simulation Model	Kohman/Haws									
Cabarrus										
MC & Louisville										
Complete NPP Database	Good									
Technology Integration	Pastorius/Wood									
Type of Support	**Support Division**	**Mgr.**								
Filler Chemical & Blend Analysis	ARD									
Database Development	CAD									
Filler & Cigt. Physical/Smoking Analysis	CTSD									
Subj. Mapping Database & POL's	PED									
Filler & Cigt. Production	Semi Works									
Equipment Installation	Dev. Engr.									
Low Weight Cigarette Design	Cigt. Dev.									
Casing/Flavor System Development	Flavor Tech.									

2021386026

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

CAST LEAF PROGRAM

2021386027

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Cast Leaf **Program No.:**

Category: Productivity/Flexibility **Date Prepared:**

Start Date: 1st QTR 1991 **Completion Date:** 4th QTR 1993

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Develop Cast Leaf Process	G. Gellatly	11.0 RTD (4R3)								
Conclude Lab Scale Evaluation of Alt Binders	G. Keritsis									
Provide Support for Process Dev. of Alt. Binders	G. Chan	1.5 CR (3R3)								
Develop Steam Pressure Pectin Release	G. Gellatly									
Optimize Drying Rate	P. Chen	0.5 PR (3R4)								
Evaluate Cast Leaf Products										
Optimize Physical Characteristics	G. Gellatly									
Survivability Studies	W. Nichols									
Cigarette Derlivery Studies	W. Nichols									
Define Subjective Target	D. Uhl									
Develop Flavor Sytstems	J. Swain	0.6 FT (5R4)								
Design Low Capital Cost Plant										
Develop Business Analysis	D. Uhl									
Develop Low Capital Cost Design	L. Lipscomb	2.0 DE (4R2)								

Type of Support	Support Division	Mgr.
2.0	ARD	
0.1	CAD	
0.7	CTSD	
0.2	PED	
1.5	Semi Works	
0.1	Cig Tech (5R3)	

2021386028

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 -1997 Five-Year Plan

Program Summary

Program: Cast Leaf

Category: Productivity/Flexibility **Included in 1992-1996 Plan:** _____

Start Date: 1st QTR 1991 **Completion Date:** 4th QTR 1994

Program Description: Develop a Cast Leaf product that will proivde flexibility in meeting world-wide utilization needs for individual tobacco types.

Importance to PM-USA: Develop Reconstituted Cast Leaf products that provide flexibility in meeting capacity needs for individual sheet types.
Support R&D programs requiring non-standard sheet.

Program Benefits: Provides potential to reduce green leaf purchases by incorporating Cast Leaf in PME's blends to a level which maintains total utilization of byproducts. Provides cast sheet with improved burn rate, lower tar delivery compared to RCB.

Program Leadership:
Functional Area: R&D **Department:** R&D **Program Leader:** G. Gellatly

Support Required From	1993 Man-Years	Leadership Dept. (93)

Capital Requirements (93) $ _____ **1993-1997** $ _____ **650 Timing** _____

Program Milestones

	1993				1994				1995				1996				1997			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Develop Cast Leaf Process																				
Evaluate Cast Leaf Products																				
Design Low Capital Cost Plant																				

2021386029

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Cast Leaf Program No.: _____

Category: _____ Date Prepared: _____

Start Date: _____ Completion Date: _____

Program Milestones	Responsible Person	Resource Allocation	1993	1994
			1 2 3 4	1 2 3 4
1. Support investigation of drying process	T. M. Howell	0.8 PR	on-going	

Type of Support	Support Division	Mgr.		
	ARD			
	CAD			
	CTSD			
	PED			
	Semi Works			

2021386030

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 -1997 Five-Year Plan

Program Summary

Program: New BL

Category: Productivity/Capacity **Included in 1992-1996 Plan:** Yes

Start Date: 3rd QTR 1991 **Completion Date:** 4th QTR 1995

Program Description: Develop NBL process and retrofit into the BL Plant.

Importance to PM-USA: Increase the production rate of the BL Plant to minimize overtime to meet forecasted requirements. Provides strategic reserve of capacity for increased demand of RCB. Improved product physicals allows reduction in formulation ammonia which reduces ammonia emissions from the BL Plant.

Program Benefits: The conversion of the BL Plant will increase the production rate from 6300 pph to 8200 pph. This will allow the plant to produce projected RCB requirements of 46 MM lb/yr in a five day week (239 operating days). The production rate increase provides strategic reserve of capacity for 64 mm pounds annually for a 7 day operation (324 operating days).

Program Leadership:

Functional Area: R&D **Department:** R&D **Program Leader:** G. Gellatly

Support Required From	1993 Man-Years	Leadership Dept. (93)
PM USA: Processing Plants	2.0	
Engineering	2.0	

Capital Requirements (93) $ _____ **1993-1997** $ _____ **650 Timing** _____

Program Milestones

	1993				1994				1995				1996				1997			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Define NBL Process Requirements and Support																				
Detailed Engineering Design																				
Qualify Reduced Ammonia NBL																				
Additives Reduction																				

2021386031

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: New BL **Program No.:**

Category: Productivity **Date Prepared:**

Start Date: 1st QTR 1991 **Completion Date:** 4th QTR 1995

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Define NBL Process and Support	G. Gellatly	5.0 - RTD (4R3)								
Detailed Engineering Design										
Evaluate NBL Formulation										
Define Chemical Precursors	R. Southwick	0.25 CR (3R3)								
Qualify Reduced NH3	J. Swain	0.4 FT (5R4)								
Evaluate Additives	R. McCuen	0.5 BR (2R3)								
Evaluate RCB Darkening and Define	W. Hempfling	0.25 AR (2R5)								
Modifications to Eliminate										

Type of Support	Support Division	Mgr.
0.5	ARD	
0.1	CAD	
0.3	CTSD	
0.2	PED	
1.0	Semi Works	
0.85	Dev Eng (4R2)	
0.1	Cig Tech (5R3)	

2021386032

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

NET PROGRAM

2021386033

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 -1997 Five-Year Plan

Program Summary

Program: NET

Category: Capacity Flexibility **Included in 1992-1996 Plan:** Yes

Start Date: Ongoing **Completion Date:** December, 1995

Program Description: The NET program consists of five major areas:

1. Product support to Leaf for NET inclusion in full margin brands.
2. Develop design criteria for conversion of DIET facilities to the NET process.
3. Support process implementations of NET into Bermuda Hundred and BOZ.
4. Support the New Primary Processing project to reach 100 mg wt reduction.
5. Develop a Short Cycle Impregnation process for use in small scale expansion systems for PM International or NPP

Importance to PM-USA: NET will allow for higher inclusion levels of expanded tobacco in full margin brands and new products. The development of a small scale expansion system will support PM International by allowing for lower delivery products to meet market demands and/or government requirements, maintaining technological advantage as a business development tool similar to DIET, and supporting the corporate trend toward standardization of our brand mix.

Program Benefits: NET will provide a higher yield expansion process. It will also provide a more tobacco-like expanded material which will allow for higher inclusion levels and reduced cigarette weight. The SCI program will allow on the spot processing for small markets where it is not economically advantageous to ship lightweight DIET long distances. It will possibly extend royalty payments to the corporation for another 17 years.

Program Leadership: B. Fischer, S. Clark, B. Riggan, S. Roberts, J. Williams

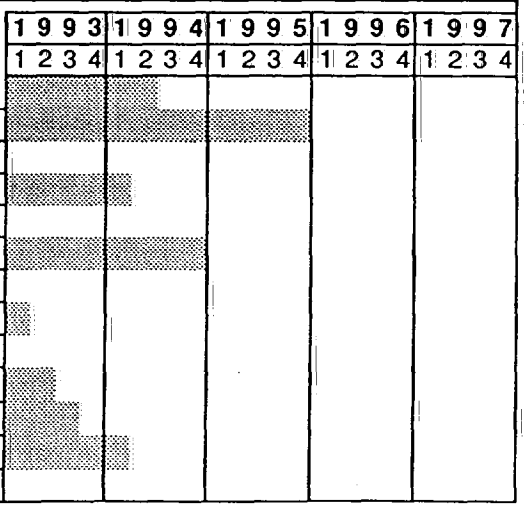
Functional Area Process Development **Department:** R&D **Program Leader:** B. Fischer

Support Required From	1993 Man-Years
Leaf	1.75
PM International	2.0

Leadership Dept. (93)	
CTSD	3.0
ARD	2.3
Proc Dev	14.25
Semiworks	4.9
Flav Tech	0.45
Cigt Tech	0.6

Capital Requirements (93) $ 3.6M 1993-1997 $3.6M 650 **Timing**

Program Milestones



2021386034

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: NET **Program No.:**

Category: Capacity Flexibility **Date Prepared:** 8/27/92

Start Date: Ongoing **Completion Date:** December , 1995

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
I. NET Product Support to Leaf	Fischer/Moogalian	4.5								
II. Develop Design Criteria for Conversion of	Fischer/Dobbs	1.0								
DIET facilities to the NET process										
III. Implement NET into Bermuda Hundred and BC	Dobbs/Winterson	1.0								
IV. Support the New Primary Processing program	Wood/Dobbs	0.75								
V. Short Cycle Impregnation:	Dobbs									
Develop the impregnation process and tobacco		1.3								
feed system										
A. Modify existing pilot plant ball valves										
B. Modify two ball valves to include pipe										
C. Evaluate and test "Scholtz", "Rapi-Door"										
impregnator, or similar impregnator										
Define and develop an alternative expansion		1.4								
process										
A. Evaluate batch expansion chamber										
B. Evaluate perforated expansion system										
C. Evaluate superheated steam vibrating										
conveyor										
Develop appropriate small scale reordering system		0.6								
A. Evaluate the potential for linear conveyor vs										
spiral reordering										
Design and build a prototype expansion system		3.7								
A. Prepare design package										
B. Purchase equipment and construct facility										
Type of Support	**Support Division**	**Mgr.**								
Chemical Analysis	ARD									
Data Analysis	CAD									
Physical Analysis and Cigarette Information	CTSD									
POL's	PED									
Tobacco Preparation and Cigarette Making	Semi Works									
Flavor & humectant evaluation	Flavor Technology									
Cigarette construction & specification	Cig. Technology									

2021386035

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

PROJECT TOMORROW

2021366036

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

CONFIDENTIAL

PHILIP MORRIS U.S.A.

INTEROFFICE CORRESPONDENCE

Richmond, Virginia

To: Dr. Jerry Whidby

Date: August 10, 1992

From: R. W. Dwyer

Subject: **1993 Operational Plan for Project Tomorrow**

PROGRAM GOAL

The goal of Project Tomorrow is to evaluate the feasibility of developing cigarette ignition-propensity tests, and to determine the technical and commercial feasibility of making cigarettes with substantially reduced ignition propensities as demonstrated by such tests.

STATUS AND BACKGROUND

Much of the work on the development of a reproducible and reliable test method for measuring cigarette ignition propensities is now done in conjunction with a Federal study under the Fire Safe Cigarette Act. This Act, which became law on August 10, 1990, empowers the Consumer Product Safety Commission to direct the National Institute of Standards and Technology to complete research on cigarette fire safety. Specifically, the law directs NIST to develop a standard method for determining cigarette ignition propensities, to compile performance data for cigarettes using the standard method, and to conduct laboratory studies on and computer modeling of ignition physics. The CPSC is directed to design and implement a study to collect baseline and follow-up data about the characteristics of cigarettes involved in fires, the types of products which are ignited by cigarettes, and the smokers involved; further, they are to develop information on the societal costs of cigarette-initiated fires. The CPSC, with the Department of Health and Human Services, is to develop information on changes in the toxicity of smoke and any resultant health effects from cigarette prototypes. The law calls for CPSC to submit a final report to Congress by August 10, 1993, and to provide an assessment of the practicality of a cigarette fire-safety performance standard.

NIST is in the process of developing both primary and secondary cigarette ignition-propensity tests. Philip Morris is cooperating with NIST in developing these tests, and we, CPSC, and NIST are scheduled to begin a preliminary protocol-evaluation phase this month. After the completion of this phase, a ten-laboratory round-robin test is planned for the last quarter of this year.

Our research has shown, and it is confirmed by the literature[1,2] that cotton fabrics without high levels of burn promoters *are not susceptible to ignition by smoldering*

[1] Robert J. McCarter, Fire Science Division, Center for Fire Research, NBS: *Smoldering Combustion of Cotton and Rayon*, Journal of Consumer Product Flammability, Vol. 4, pp 346-358 (1977)

2021386037

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

cigarettes. Whether or not a fabric can be ignited by a smouldering cigarette depends on the fabric's burn-promoter content. Therefore, ignition tests are dependent on fabrics which contain high levels of burn promoters. The Joint Venture on Ignition Propensity Test Development is in the process of documenting this observation more fully. The Joint Venture has obtained 500 different upholstery fabrics. Each of these fabrics were screened for ignitability using an experimental cigarette type which NIST had found to have a high ignition propensity. We found 145 of the 500 fabrics to be ignitable by this high-IP cigarette in the as-received condition. Since then, we have had the 145 fabrics rinsed in cold water. These fabrics are to be re-tested for ignition propensity later this month.

We are examining a number of means for evaluating cigarette ignition propensities. In performing primary testing, the outcomes generally fall into two categories: ignitions and extinguishments, or non-ignitions and extinguishments. Whether the fabric sustains smolder is a fabric property, i.e., the outcome depends on the burn-promoter content of the fabric. However, extinguishments appear to be affected by properties of both cigarettes and fabrics. The NBS ranked thirty-two experimental cigarettes in the original TSG report of 1987. Four cigarette manufacturers re-made these models earlier this year. Experimental models with low TSG ignition propensities tend to have higher extinguishment potentials on a given fabric. We also find that as the fabric basis weight increases, the percent extinguishments of a given cigarette design increases.

Our challenge has been to find test conditions which can discriminate among experimental cigarettes in the higher NBS-IP range. We are continuing to examine the influences of test materials, configurations, and conditions. The fourth CORESTA collaborative study has been planned and should be implemented in the last quarter of this year. In this study, we are examining the effects of fabric burn-promoter type and level on experimental cigarette ignition propensities.

We are working with the Paper Technology Group to evaluate the effects of banded wrappers on cigarette ignition propensities. Cigarettes made with wrappers having bands of Avicel show variable burn rates. The coals progress normally along the tobacco rod until they reach the band. In the banded region the linear burn rate is reduced in proportion to the amount of Avicel on the wrapper; if the Avicel content is high enough, the coal will extinguish in the band during free smolder. Cigarettes made with experimental wrappers containing three bands have been produced experimentally and are being prepared for testing. The greatest problem with this project is obtaining reliable samples. The technology required for the consistent application of a target amount of material in a fixed location on the paper is not currently available. Further, the technology to register the bands during cigarette making is not available. These areas are being investigated.

We are also working with Product Development and the Leaf Department to design low-density cigarettes with low mass burn rates. Various designs have been made which have low mass burn rates. Leaf is seeking low-density blends for these samples using both DIET and NET technologies. Product Development is having the samples made, CTSD-tested, and subjectively evaluated. Some candidates have been produced which have met

2021386038

---

[2] Darrell J. Donaldson, D.A. Yeadon, and R.J. Harper, Southern Regional Research Center: *Smoldering Phenomenon Associated with Cotton*, Textile Research Journal, Vol. 53, pp 160-164 (1983)

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

our MBR targets. However, all have been found subjectively unacceptable. Further work is required with these designs.

STRATEGIES

In order to achieve our goal, we are pursuing four strategies for this program:

1. Evaluate the feasibility of developing scientifically valid and reproducible cigarette ignition-propensity tests which will reflect real-world conditions, and evaluate the technical and commercial feasibility of making cigarettes with reduced ignition propensities with respect to such tests.
2. Evaluate the mechanisms of cigarette-initiated fabric ignitions and attempt to develop a computer model of a cigarette interacting with a substrate.
3. Determine the effects of banded wrappers on cigarette ignition testing.
4. Continue to pursue the design of cigarettes at reduced mass burn rates which demonstrate subjectively acceptable performance properties.

Strategy 1. Test Development

Tactics and Timetable

1. Complete the NIST ignition-propensity round robin and evaluate the effects of cigarette design, test materials, and test conditions on the results. (1Q93)
2. Investigate the influence of banded wrapper designs on IP tests with cotton ducks and filter papers. (1Q93)
3. Evaluate the effects of cigarette-design variables on cotton duck fabrics and filter papers in both flat and crevice configurations. (3Q93)
4. Evaluate the NIST IP-tests which are anticipated to be incorporated in the final report of the TAG. (2Q93)
5. Determine the effects of cigarette design on the NIST primary and secondary tests. (4Q93)

Resource Requirements

Test Manager/Data Analyst	0.5
Test Technicians	3.0
Project Leader	0.4

2021386039

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Strategy 2. Mechanisms and Models

Tactics and Timetable

1. Investigate the influence of bands on extinguishments using neutron and X-ray radiography. (1Q93)
2. Experimentally evaluate the roles of heat conduction and oxygen blockage in extinguishments. (2Q93)
3. Determine the influence of wrapper properties on the mass of tobacco consumed during a puff using neutron radiography. (3Q93)
4. Use IR, Schlieren, X-ray, and neutron imaging to examine the cigarette and substrate structures during smouldering. (3Q93)
5. Combine the cigarette and substrate models in an attempt to predict the effects of cigarette design, fabric and foam materials, and experimental conditions on ignition. (4Q93)

Resource Requirements

Radiographer	0.3
Thermal Physicists	2.0
Combustion Modelers	2.0
Project Leader	0.1

Strategy 3. Banded Wrappers

Tactics and Timetable

1. Attempt to develop banded cigarette paper capability at a pilot facility. (on-going)
2. Explore improving the properties of Avicel to meet subjective requirements. (on-going)
3. Evaluate the influences of band mass, width, and spacing on ignition tests. (2Q93)
4. Evaluate the influences of band mass, width, and spacing on the NIST ignition tests. (3Q93)
5. Attempt to develop commercial banded-wrapper technology and capability in conjunction with outside paper manufacturers. (on-going)

Resource Requirements

Paper Technologist	1.5
Cigarette Designer	0.3
Test Technician	0.2
Project Leader	0.1

2021386040

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Strategy 4. New Cigarette Designs

Tactics and Timetable

1. Attempt to optimize the properties of low-MBR, low-density designs. (on-going)
2. Test such designs with the NIST primary and secondary methods. (on-going)
3. Attempt to redesign and reformulate all of our cigarette brands to meet the NIST primary and secondary standards. (on-going)

Resource Requirements

Cigarette Designer	2.0
Blend Designer (Leaf Department)	2.0
Flavor Scientist	2.0
Cigarette Production Administrator	2.0
Test Technician	0.3
Semiworks, CTSD, and NET Support	2.0
Project Leader	0.4

RESOURCE REQUIREMENTS SUMMARY

Test Manager/Data Analyst	0.5
Test Technicians	3.5
Radiographer	0.3
Thermal Physicists	2.0
Combustion Modelers	2.0
Paper Technologist	1.5
Cigarette Designer	2.3
Blend Designer (Leaf Department)	2.0
Flavor Scientist	2.0
Cigarette Production Administrator	2.0
Semiworks, CTSD, and NET Support	2.0
Project Leader	1.0
TOTAL	21.1

2021386041

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

OPERATIONS SUPPORT

2021386042

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Process Monitoring **Program No.:**

Category: Operations Support **Date Prepared:** 8/18/92

Start Date: 1/1/93 **Completion Date:** 12/93

Program Milestones	Responsible Person	Resource Allocation	1993 1 2 3 4	1994 1 2 3 4
Assess reference methods for calibration of on-line moisture monitors	G. Hicks-White	2.90		
Access reference methods for newly implemented on-line moisture monitors	M. Parrish	0.55		
Evaluate bench-top spectroscopic based instruments for rapid moisture determination	W. Lewis	0.50		
Improve GC water determination. Compare GC/KFW as reference methods for calibration	B. Kanipe	0.30		
Develop/implement method for moisture in tob. unpacked from hogshead or PM80 box	M. Parrish	0.55		
Assess needs for other monitors for ingredients	C. Harward	0.15		
Develop/implement other monitors as needed	C. Harward	2.00		
Transfer menthol to manufacturing primary	W. Lewis	0.35		
Develop implement/monitor for qualitative identification of A/C	W. Lewis	0.45		
Support transfer of off-line blend determination	C. Harward	0.15		
Develop on-line tobacco blend analysis	C. Harward	1.15		

Type of Support	Support Division	Mgr.
Flavor/OV/H2O Analysis	ARD	
System Interface	CAD	
Humectant/Menthol Analysis	CTSD	
	PED	
Sampling/Instrument Installation	Semi Works	

2021386043

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

PHILIP MORRIS U. S. A.

INTER-OFFICE CORRESPONDENCE

Richmond, Virginia

To: R. Ferguson **Date:** August 17, 1992

From: B. Kanipe

Subject: Operational Plans for 1993 - Process Monitoring

Summarized below are the projected 1993 operational plans for Process Monitoring. I have included the responsible person for each tactic, as well as, an estimate of the man power required to meet the completion targets provided. Attached you will find the program summary for inclusion in the R&D Operational Plans. If you have any questions, please let me know.

Program Objective

Develop and implement appropriate analytical techniques and instrumentation for the on-line, at-line, and off-line quantification of specific components in tobacco, tobacco materials, flavors, and cigarettes materials in PM USA processing plants in order to improve process control and manufacturing efficiency.

Tactic	Schedule	Responsible Person	Resources (Man Years)
Strategy #1- Assess current methodologies, and develop and implement new technology for moisture determination in tobacco and tobacco materials.			
Assess reference methods for calibration of on-line and off-line moisture monitors utilizing Semiworks as the test facility	Phases II and III, 2nd Qtr Phases IV and V, 4th Qtr	G. Hicks-White	Prof. 0.90 Tech. 2.00
Assess reference methods for calibration of newly implemented on-line and off-line moisture monitors (such as Cast Leaf, NET, New Primary).	Cast Leaf, NET, 2nd Qtr New Primary, 4th Qtr	M. Parrish	Prof. 0.35 Tech. 0.20
Evaluate various bench-top systems based on spectroscopic techniques for the rapid determination of moisture in tobacco and tobacco materials.	3rd Qtr	W. Lewis	Prof. 0.35 Tech. 0.15

2021386044

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Tactic	Schedule	Responsible Person	Resources (Man Years)
Strategy #1 cont'd			
Improve the current GC water determination with regard to extraction time and accuracy for use as the reference method for calibration of the moisture monitors. Compare advantages and disadvantages of GC water and Karl Fischer as reference methods.	2nd Qtr	B. Kanipe	Prof. 0.20 Tech. 0.10
Develop and implement a method for determining the moisture content of tobacco unpacked from a hogshead or PM80 box prior to conditioning.	4th Qtr	M. Parrish	Prof. 0.40 Tech. 0.15
Strategy #2- Develop and implement monitors for ingredients added to tobacco and tobacco materials during processing.			
Assess needs for monitors for determination of dry weight in primary processing.	1st Qtr	C. Harward	Prof. 0.15
Develop and implement monitors as defined above.	4th Qtr	C. Harward	Prof. 1.25 Tech. 0.75
Transfer on-line menthol to manufacturing primary	2nd Qtr	W. Lewis	Prof. 0.30 Tech. 0.05
Develop and implement a monitor for the identification of A/C for New Primary Processing	4th Qtr	W. Lewis	Prof. 0.35 Tech. 0.10
Strategy #3- Develop and implement rapid technology for the on-line and off-line determination of blend composition in support of New Primary			
Support methodology transfer of off-line determination	1st Qtr	C. Harward	Prof. 0.15

2021386045

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Tactic	Schedule	Responsible Person	Resources (Man Years)
Strategy #3 cont'd			
Develop on-line technology for blend analysis	4th Qtr (75%)	C. Harward	Prof. 0.90 Tech. 0.25

[1] Kanipe, B., "Calibration of On-line Moisture Monitors," memo to T. Phan, April 30, 1992.

Attachment

cc: C. Ellis
D. Leyden
C. Harward
G. Hicks-White
K. Koller
W. Lewis
M. Parrish

2021386046

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Operations Support **Program No.:**

Category: Flavor Change on Products **Date Prepared:** 8/20/92

Start Date: **Completion Date:**

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Permeation study on films	J. Pierotti	0.3								
develop an analytical method										
aftercut solution										
whole pack of cigarettes										
Analysis of flavors in cigarettes	S. Yang	0.5								
develop analytical methods	R. Esperdy									
analysis of samples	V. Willis									
correlation between analytical results and										
subjective test										
"Stale" cigarette and water content										
evaluate results from experiments in 1992	S. Yang	0.3								
define difference between stale and	R. Esperdy									
control cigarettes										
add back flavors to stale cigarettes and										
subjctive test										

Type of Support	Support Division	Mgr.
	ARD	
	CAD	
	CTSD	
	PED	
	Semi Works	

2021386047

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

PHILIP MORRIS U. S. A.

INTER-OFFICE CORRESPONDENCE

Richmond, Virginia

To: R. Ferguson **Date:** Aug. 18, 1992

From: S. S. Yang

Subject: Operational Plan - 1993

Flavor Change on Products

Objective:

Determine the permeability/retention of flavor on products with new packaging films to provide information for shelf-life improvement of products.

Strategies:

In an effort to improve the shelf-life of products, analytical methodologies were applied to evaluate new packaging films. The data will be combined with the results of subjective tests to investigate the correlation between the flavor retention and the freshness of products.

Strategy #1: Permeability of flavor components on packaging films.

- Tactic 1: Revise a purge/trap/GC procedure or develop other techniques for measuring flavor permeation on films.
- Tactic 2: Develop a procedure for measuring permeation of aftercut solution on films.
- Tactic 3: Apply Tactics 2 to the whole pack of cigarettes.

Strategy #2: Quantitative analysis of flavor components in cigarettes wrapped with various films and tested under different temperature and humidity environments.

- Tactic 1: Adopt or develop analytical methods to handle a large number of samples in a timely manner
- Tactic 2: Analyze samples according to the plan.
- Tactic 3: Evaluate the correlation between analytical results and subjective test

Strategy #3: Relationship between a perception of "stale" and the water content of the sample.

- Tactic 1: Evaluate the results of a current experiment, in which water was carefully moved into and out of samples to examine what, if any, correlation exists. This experiment was initiated in 1991 and will be finished by the end of 1992.
- Tactic 2: Define difference in profiles of "stale" and control cigarettes.
- Tactic 3: Add back "flavors" to "stale" cigarettes followed by subjective test.

Resources:

(1) 0.2 to 0.3 man-years for the permeation study.
(2) 0.4 to 0.6 man-years for the analyses of flavors.
(3) 0.3 man-years for "stale".

2021386048

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Operations Support **Program No.:**

Category: Cost/Productivity **Date Prepared:** 8/24/92

Start Date: **Completion Date:**

Program Milestones	Responsible Person	Resource Allocation	1993 1 2 3 4	1994 1 2 3 4
Review current business impact of packaging	J. Lephardt	.4		
specifications problems				
Define avoidance/remediation options and	J. Lephardt	.4		
potential ROI's				
Assess monitoring requirements and impact	J. Lephardt	.20		
on operations				
Develop and define monitoring protocols and	J. Lephardt	1.20		
methods, if warranted				

Type of Support	Support Division	Mgr.
Method Development	ARD	
	CAD	
	CTSD	
	PED	
	Semi Works	

2021386049

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

PHILIP MORRIS U. S. A.

INTER-OFFICE CORRESPONDENCE

Richmond, Virginia

To: D. Leyden **Date:** August 19, 1992

From: R. Ferguson

Subject: *Operational Plans for 1993 R&D Commitments*

PROG. CATEGORY: Cost/Productivity

ITEM: Packaging with Solvents Above Specification

OBJECTIVE: Develop a process to reclaim packaging with out of specification solvent levels.

STATUS: Most printed materials used by Manufacturing are conventional gravure and these could be candidates to reclaim when out of specification.

For conventional gravure, all printers now have in place analytical methods and heating chambers to reduce solvent levels. There is agreement that the incidence of solvent related problems is decreasing. There is complete consensus the the highest priority is the resolution of this issue before printed packaging is received by PM. No "salvage" considerations should coe at the expense of any resources needed to to complete fundamental improvements in our packaging materials.

The understanding of various offset printing chemistries and totally water borne gravure printing are not advanced enough at this time to consider implementation of this objective with these printed materials.

STRATEGY: Review current business situation related to out of specification printing solvents on packaging materials.

TACTIC: Define the current economic impact and use in assessments of cost/benefit for any avoidance or remediation approaches.

RESP. PERSON: J. Lephardt

STRATEGY: Define and evaluate avoidance and remediation options.

2021386050

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

TACTIC:	Contact experts in QA, Purchasing, Manufacturing and the printing companies to develop options and cost/benefit analyses.
RESP. PERSON:	J. Lephardt
STRATEGY:	Evaluate the need for an in-coming materials solvent determination procedure and, if warranted, develop and demonstrate such a procedure.
TACTIC:	Contact experts in QA, Purchasing and Manufacturing to determine the utility and potential impact of a more rapid solvent procedure.
RESP. PERSON:	J. Lephardt

2021386051

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Operations Support **Program No.:**

Category: Customer Complaints **Date Prepared:** 8/19/92

Start Date: **Completion Date:**

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Evaluate purge and trap techniques for sampling	S. Yang	0.1								
customer complaint samples										
Provide analyses for routine customer complaint	S. Yang	0.3								
samples on an as needed basis										

Type of Support	Support Division	Mgr.
Personnel and Equipment	ARD	
	CAD	
	CTSD	
	PED	
	Semi Works	

2021386052

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

PHILIP MORRIS U. S. A.

INTER-OFFICE CORRESPONDENCE

Richmond, Virginia

To: R. Ferguson **Date:** August 15, 1992

From: D. C. Watson

Subject: Customer Complaints - Operational Plans - 1993

Objective: Provide qualitative and quantitative analyses and product comparisons for Quality Assurance in support of evaluation of consumer complaints.

Status: Samples routinely received from QA are examined by nondestructive microscopic techniques and then subjected to appropriate analyses for comparison to controls. Results are reported to QA by memo.

Strategies: Returned goods and customer complaint samples that might relate to health issues are examined by established analytical procedures for comparisons to appropriate control cigarettes.

New and modified sampling and analysis technologies will be investigated to reduce sample turn-around and provide sensitive procedures for a broader range of compound types.

Tactics and Timetable: Purge and trap combined with inline gc/ms separation and identification of components will be compared to the present analyses protocols during quarter 1 and 2. If found to provide a more global type of data, especially of providing data that might relate to definition of intentional product adulteration, the existing protocol will be changed to reflect the new techniques.

Samples are received from QA on an on-going basis and will be analyzed as-received.

2021386053

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Operations Support **Program No.:**

Category: International Unauthorized Marlboro **Date Prepared:** 8/13/92

Start Date: **Completion Date:**

Program Milestones	Responsible Person	Resource Allocation	1993 1 2 3 4	1994 1 2 3 4
Define analyses to be done	D. Miser			
Develop International protocol	T. Sanders/M. Bourlas			
Analysis of materials from known suppliers	Baliga/Miser/Thompson	0.2		
Determination of most useful characteristics				
Microscopy	Baliga/Miser/Thompson	0.4		
Infrared	Griff	0.2		
Flavors, Plasticizers, etc.	Watson	0.2		
New pickups & database generation				
Microscopy	Baliga/Mise/rThompson	0.3		
Infrared	Griff	0.1		
Flavors, Plasticizers, etc.	Watson	0.05		
(CTSD) Blending				

PHILIP MORRIS U. S. A.

INTER-OFFICE CORRESPONDENCE

Richmond, Virginia

To: R. Ferguson **Date:** Aug. 13, 1992

From: D. Miser

Subject: Operations Support for International Unauthorized Marlboro Study

Objective:

The study is designed to identify the manufacturers of unauthorized product sold as US export. The current magnitude of this problem has yet to be determined. However, projections based on the production from a recently identified manufacturer suggests that this operation alone was responsible for a loss of US production of two billion units/year. Preliminary work suggests that from 5 to 8 such operations have appeared within the last two months. In addition to lost revenue through lost sales, the quality of these unauthorized products is considerably less than that of Marlboro, and thus places the entire franchise at risk through lost customers.

Strategy:

Identification of the producers of unauthorized product will be facilitated by the development of a characteristics database. The database will consist of two types of characteristics; those that are specific to individual factories, and those that are characteristic of the purchasable materials used by these operations.

Tactics:

A. A series of analyses of characteristics will be identified that are to be applied to all incoming samples and input to the database.

B. Protocol will be developed for sample pickup, coding, reporting, and the coordination of efforts between Richmond R&D, FTR-R&D, Luzanne, and the sales force. The analyses to be performed will be divided between Richmond and Europe by mutual agreement.

C. Materials from known suppliers will be obtained and analyzed and the results added to the database.

D. Those characteristics that prove to be the most useful in the identification of unauthorized operations will be determined and subsequent analyses will be restricted to those characteristics.

E. New pickups of unauthorized product will be compared to the database for identification. If these samples prove to be from unknown operations, their data will be entered into the database and the operation will be located through their materials suppliers.

2021386055

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Operations Support **Program No.:**

Category: Environmental Analyses **Date Prepared:** 8/20/92

Start Date: **Completion Date:**

Program Milestones	Responsible Person	Resource Allocation	1993 1 2 3 4	1994 1 2 3 4
Develop/apply on-line phosphine monitor for	J. Lephardt	0.25		
absorption studies	K. Podraza	0.2		
Provide support to nicotine destruction studies	S. Yang	0.25		
	K. Podraza	0.30		
Develop analytical procedures and apply to	D. Watson	0.25		
absorption/desorption and concentration studies	K. Podraza	0.1		
Evaluate techniques for TKN determination	B. Handy	0.15		
	K. Podraza	0.30		
Develop/apply analytical methods for trace	S. Yang	0.25		
alkaloids in KNO3				
Investigate on-site stack analysis	D.Watson	0.25		
Participate in planning and data validation of stack	D. Watson	0.25		
gas samples				
Provide analytical support for stack gas samples	D. Magin	1.0		
Identify/validate consulting labs	D. Watson	0.35		
Provide analytical resources for waste water	D. Fox	0.75		
and sludge				
Provide elemental composition data for waste	K. Torrence	0.25		
water and sludge				
Type of Support	**Support Division**	**Mgr.**		
Personnel & Resources	ARD			
	CAD			
	CTSD			
	PED			
	Semi Works			
Personnel & Resources	RTD			

2021386056

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

PHILIP MORRIS U. S. A.

INTER-OFFICE CORRESPONDENCE

Richmond, Virginia

To: R. Ferguson **Date:** August 18, 1992

From: D. C. Watson

Subject:

Environmental Analyses - Operational Plans - 1993

Objective:

Develop and apply analytical techniques and methodology in support of studies by the Environmental Compliance and Engineering and the Applied Technology groups and in support of associated R&D projects.

Strategy:

#1 The Environmental Compliance and Engineering department has requested a significantly increased R&D involvement in direct support to PM environmental concerns during 1993 including an emphasis on providing in-house analytical data for process stack effluents. Sampling and analysis protocols will be developed, verified and applied for the qualitative and quantitative descriptions of air, water and solid waste effluents. Consulting and contract laboratories will be identified and their capabilities will be validated.

#2 Since environmental concerns must now become a part of all new processes, support will be provided for the research that is related to processes and product development. The overall responsibilities will include ARD interaction with personnel from the Environmental Compliance and Engineering Department, with Applied Technology personnel and with all pertinent research and analytical groups at R&D to assure compliance with applicable regulations.

Status:

Analytical methodologies have been developed and applied in support of much of the on-going research and of studies of processing plant effluents. This includes direct work and collaborative efforts related to aqueous and to exhaust gas effluents, residual alkaloids in waste water, TCLP values for proposed land fill waste, solid absorbant efficiencies for specific tobacco related components and insect control systems.

Tactics:

- Develop at-site analytical procedures for selected research studies and support with ARD resources.
- Develop and apply discrete sample/analysis methodologies in support of nicotine destruction studies.
- Develop on-line quantitation for phosphine absorption studies.

2021386057

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

- Provide analytical technology to support work related to ammonia and VOC's reduction.
- Determine methodology for relating 'nitrogen' to 'total Kjeldahl nitrogen'.
- Identify qualified consulting laboratories and develop protocols for continuous quality assurance of their data.
- Investigate the potential for on-line speciation of stack gas effluents using chromatographic and/or spectrometric techniques.
- Participate in the planned sampling/analysis of PM stack effluents in Richmond, Cabarrus and Louisville and provide support in the form of analytical and lab validation data for the (over 350) discrete sampling points.
- Provide BOD, COD and Nitrogen data for waste water and/or sludge streams with elemental composition and TCLP involvement on an as-needed basis.

2021386058

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Operations Support **Program No.:**

Category: International Stemmery Kabat Qualification **Date Prepared:** 8/17/92

Start Date: 2/1/93 **Completion Date:** 1/94

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Establish workspace to process samples and equip	W. Ryan	0.1								
with consummables. Hire temporary and train										
Nine lines targetted for 1st qtr- complete analyses		0.5								
2nd qtr.										
Four lines targetted for qualification 3rd quarter;		0.1								
complete analyses 1st qtr.,'94										

Type of Support	Support Division	Mgr.
Analytical	ARD	
	CAD	
	CTSD	
	PED	
	Semi Works	

2021386059

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Operations Support **Program No.:**

Category: Cooperative Leaf Studies **Date Prepared:** 8/19/92

Start Date: **Completion Date:**

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
To participate in the cooperative tobacco industry	R. Bass	0.4								
program in order to assure that the quality of all new										
tobacco varieties meet or exceed all requirements										
as defined in minimum standard program										
Provide chemical analyses to support PM										
participation in the Cooperative Tobacco Variety										
Evaluation Program. Provide chemical analyses										
to asssts in studies supported by the Leaf										
agronomists. Participate in collaborative studies										
between industry and university laboratories to										
validate and improve secondary alkaloid										
measurements										
The Tobacco Variety Breeding programs, and										
programs which deal with crop management										
investigations such as crop spading, maturity										
and fertilization										

Type of Support	Support Division	Mgr.								
Alkaloids, reducing sugars, nitrogen analyses	ARD									
	CAD									
	CTSD									
	PED									
	Semi Works									

2021386060

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

COOPERATIVE LEAF STUDY

OBJECTIVE: To participate in the cooperative tobacco industry program in order to assure that the quality of all new tobacco varieties meet or exceed all requirements as defined by minimum standards program. To support the Tobacco Variety Breeding Programs, and other programs which deal with crop management investigations such as crop spacing, maturity and fertilization.

STRATEGY: Provide chemical analyses to: 1) support PM participation in the Cooperative Tobacco Variety Evaluation Program and 2) assist in studies supported by the PM R&D Leaf Agronomists. Participate in collaborative studies between industry and university laboratories to validate and improve secondary alkaloid measurements.

TACTICS: Support for these programs will continue as in recent years. Alkaloids, Reducing Sugars, and Nitrogen are the analyses most frequently required. Analyses on 1993 Bright samples in 3rd quarter, 1993 burley crop in 4th quarter requires 0.4 analyst year.

CONTACT PERSON: B. Handy, ARD

INTERNATIONAL STEMMERY KABAT QUALIFICATION

OBJECTIVE: To qualify the Kabat Application Lines at contract stemmeries suppling off-shore tobacco to PM.

STRATEGY: Provide chemical analyses to monitor the levels of methoprene on samples taken from selected points in the Kabat application process line.

TACTICS: Perform methoprene and OV analyses on dryer exit and hogshead core samples from thirteen line qualification tests. Nine lines are to be tested 1st quarter and four lines in 3rd quarter require 0.7 analyst years.

CONTACT PERSON: B. Ryan, ARD
G. Koval, Engineering

2021386061

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Operations Support **Program No.:**

Category: Crop Protection Agent Analysis **Date Prepared:** 8/17/92

Start Date: 1/1/93 **Completion Date:** 12/31/93

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Methodology										
FTR methods fully in place -as needed	R. Davis	3.5								
Improve FTR methodology-as needed										
Maintain TCLP methodology-as needed										
Assume USDA analysis -4/1/93										
Implement MH-30 method -1/1/93										
Integrate mass selective detector -12/31/93										
Improve efficiency -as time permits										
Other CPA's from leaf-as provided by FTR										
Documentation										
Revised & improved procedures -2/1/93										
TCLP procedures -1/1/93										
New methods - within month of receipt										
Technical Support -as needed										

Type of Support	Support Division	Mgr.
Personnel, equipment, space	ARD	
Equipment, personnel	CAD	
	CTSD	
	PED	
	Semi Works	

2021386062

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Crop Protection Agents
1993 Operational Plans

Program Objective: To insure that tobacco product components and other materials meet regulatory requirements.

Strategy: Provide methodology and measurements of crop protection agents (CPA) as needed.

Tactics:

A. Establish and/or maintain necessary methodology for all PM USA ongoing CPA analyses.
   1. Implement and maintain FTR methodology in the CPA laboratory.
   2. Revise and improve FTR methodology as needed.
   3. Maintain methodology for TCLP including appropriate cleanup studies where needed.
   4. Establish full methodology capability and responsibility for all USDA leaf analyses.
   5. Implement the ARD HPLC MH-30 method.
   6. Continue development of the mass selective detector as primary quantitative and qualitative tool.
   7. Seek alternative equipment for improved efficiency and accuracy.
   8. Establish methodology as supplied by FTR for analysis of eight additional CPA's as presently identified by the leaf department.

B. Provide documentation of methodology sufficient for ARD Methods Manuel requirements.
   1. Document revised and improved procedures.
   2. Document TCLP procedures necesssary for PM samples.
   3. Document new methods.

C. Provide technical support for other PM departments.

Responsible Individual: R. E. Davis

2021386063

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Operations Support **Program No.:**

Category: Indirect Material Evaluation **Date Prepared:** 8/24/92

Start Date: **Completion Date:**

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Identification of material components by FTIR methods	G. Vilcins	1.6								
GC-FTIR analysis of indirect materials	N. Jensen	0.1								
Pyrolysis-FTIR analysis of indirect materials	M. Griff	0.2								
Pyrolysis GC-MS analysis of indirect materials	N. Einolf	0.1								
Raman analysis of materials	G. Vilcins	0.3								
X-ray fluorescence analysis of indirect materials	M. Griff	0.1								
Microscopic analysis	V. Baliga	0.1								
Determination of acceptability of the materials using established guidelines	G. Patskan	0.5								

Type of Support	Support Division	Mgr.
	ARD	
	CAD	
	CTSD	
	PED	
	Semi Works	

2021386064

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

PHILIP MORRIS U. S. A.

INTER-OFFICE CORRESPONDENCE

Richmond, Virginia

To: R. Ferguson

Date: August 17, 1992

From: Gunars Vilcins

Subject: Indirect Material Evaluation 1993 Operational Plans

1. Indirect Material Evaluation

Program Objective: To identify the chemical composition of the commercial materials used at the various Philip Morris facilities in order to screen the materials for their acceptability in cigarette manufacturing.

Strategy: Infrared analysis including microscope-FTIR will be the primary procedure for the indirect materials.

Raman spectroscopic analyses of materials when this technique is required.

X-Ray fluorescence spectroscopy, pyrolysis, halogen tests, and mass spectroscopy will be employed as needed.

Determination of the acceptability of the materials using established guidelines.

Duration of Study: This study is a continuous program.

Estimated Resources: The program will use 3.0 persons per year.

cc: D. Watson

2021386065

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Operations Support **Program No.:**

Category: Direct Material Evaluation **Date Prepared:** 8/24/92

Start Date: **Completion Date:**

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Identification of adhesive components using various techniques	K. Dudzinski	0.8								
Determine the variability between vendors and lot-to-lot variation	K. Dudzinski	1.7								
Chemical composition of printing inks	C. Keene	0.6								
Determination of residual components on paper products	C. Keene	0.4								
Characterization of papers, packaging materials, filters, additives to tobbaco , and other direct materials	G. Vilcins	0.5								
Specifications of Flavors	N. Einolf	0.5								
Evaluation of solid materials by HPLC procedures	B. Baronian	0.6								
Determination of acceptability of the materials using established guidelines	G. Patskan	0.5								

Type of Support	Support Division	Mgr.
	ARD	
	CAD	
	CTSD	
	PED	
	Semi Works	

2021386066

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

PHILIP MORRIS U. S. A.

INTER-OFFICE CORRESPONDENCE

Richmond, Virginia

To: R. Ferguson **Date:** August 17, 1992

From: Gunars Vilcins

Subject: Direct Material Evaluation 1993 Operational Plans

1. Direct Material Evaluation

Program Objective: To determine the chemical composition of the materials used at the various Philip Morris facilities in order to determine their acceptability in making the product we sell.

Status: The Direct Materials Evaluation Program is a co-operative effort of Technical Services, Purchasing, QA, and other Philip Morris personnel to ensure that the product we sell meets all the requirements for an excellent product.

Strategy: Identify the chemical composition of adhesives using the appropriate analytical procedures and instrumentation, such as FTIR, GC/MS, Raman, GPC, and other techniques when necessary.

Determine the chemical composition of printing inks by the appropriate procedures.

Identify and quantitate the residual volatile odoriferous components on printed materials.

Characterize the chemical composition of papers, filters, packaging materials, plasticizers, additives to tobacco, and other materials as necessary.

Determination of the acceptability of the materials using established guidelines.

Duration of Study: This study is a continuous program.

Estimated Resources: The program will use 5.6 persons per year.

cc: D. Watson

2021386067

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Operations Support **Program No.:**

Category: Entomology Support **Date Prepared:** 8/92

Start Date: Ongoing **Completion Date:**

Program Milestones	Responsible Person	Resource Allocation	1993 1 2 3 4	1994 1 2 3 4
Write memos documenting communications/visits	D. Faustini	0.5 prof.	as requested	
to sites/etc. re: support to PM USA/PMI/PM				
Operating Companies				
Draft a memo re: effect on reduced phosphine	D. Faustini	0.2 prof.		
levels on CB mortality. Write a proposal on a		0.1 tech.		
CB-phosphine dose response study		0.1 prof.		
Supply information on the Quality Audit. Sample	D. Faustini	0.3 prof.	as requested	
Analysis form re: customer complaints				
Write recommendations re: CB mortality as it	D. Faustini	0.3 prof.	as requested	
pertains to processing equipment		0.1 tech.	as requested	
Train personnel for Kabat measurements on	B. Davies	0.2 prof.	as requested	
tobacco using ELISA				
Gather Dianex baseline data using ELISA	B. Davies	0.3 prof.		
Show usefullness of ELISA/Dianex data	B. Davies	0.1 prof.		
Develop an SOP for Dianex measurements	B. Davies	0.1 prof.		
using ELISA				
Transfer ELISA technology for Dianex	B. Davies	0.1 prof.	as requested	
measurements to QA personnel				

Type of Support	Support Division	Mgr.
Analylsis of samples for requested compounds	ARD	
	CAD	
	CTSD	
Experimental design; data analyses	PED	
	Semi Works	

2021386068

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Operations Support **Program No.:**

Category: Microbiology **Date Prepared:** 8/20/92

Start Date: Ongoing **Completion Date:**

Program Milestones	Responsible Person	Resource Allocation	1993 1 2 3 4	1994 1 2 3 4
Write memo to or where appropriate call the	D. Teng	0.5 prof.	as requested	
requestor with the results of the microbiology		0.1 tech.	as requested	
support work				
Conduct timely assays re: the effectiveness of	D. Teng	0.2 prof.		
Sylgard to inhibit mold		0.1 tech.		
Sample NBL process and the finished sheets	D. Teng	0.7 prof.		
during storage with and without sorbate		0.1 tech.		
Document results of the process and storage studies	D. Teng	0.1 prof.		

Type of Support	Support Division	Mgr.
Analyses of samples for Sylgard and sorbate	ARD	
	CAD	
	CTSD	
Experimental design and data analyses	PED	
	Semi Works	
Run NBL process to make sheets	RTD	

2021386069

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 OPERATIONAL PLANS FOR OPERATIONS SUPPORT

OBJECTIVE: To monitor methoprene on tobacco and tobacco processing equipment so as to be in compliance with the pesticide label, protect the tobacco, and not waste the pesticide.

STRATEGY: Use enzyme-linked-immunosorbent assays (ELISAs) to accomplish this in field-type environments.

STATUS: The usefulness and applicability of the methoprene ELISA has been proven when compared to the standard HPLC measurement method.

TACTICS: Supply ELISA kits and training to applicable personnel for the measurement of Kabat® on tobacco.

Gather baseline data regarding Dianex® levels in the manufacturing facilities. Show usefulness of measurements (i.e., decrease number of applications; decrease points of application, etc.).

Develop an SOP for Dianex® measurements in the cigarette manufacturing facilities.

Transfer technology to QA personnel.

RESPONSIBLE INDIVIDUAL: B. Davies

2021386070

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 OPERATIONAL PLANS FOR OPERATIONS SUPPORT

OBJECTIVE: To test the efficacy of potassium sorbate in NBL under storage conditions. If this and other preservatives are not efficacious, this will be a cost savings and one step towards reducing the ingredients list.

STRATEGY: To stabilize reconstituted products during storage.

STATUS: A proposal outlining the approaches to be taken has been written and accepted by Management.

TACTICS: Sample the NBL process with and without sorbate in the C Pilot Plant for microbiological "hot spots".

Examine NBL sheets with and without sorbate for their microbiological profile for up to 12 weeks of storage under a variety of conditions.

RESPONSIBLE INDIVIDUAL: D. Teng

2021386071

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 OPERATIONAL PLANS FOR OPERATIONS SUPPORT

OBJECTIVE: To have the capability to determine the microbial loads in or the effect of processing on feedstocks, flavors/casings, and resulting products; to be able to identify microorganisms. Failure to have these capabilities could result in loss of feedstocks/flavors/casings and ultimately a compromised product.

STRATEGY: As requested, examine microbiologically all phases of cigarette manufacture.

STATUS: Not applicable.

TACTICS: Act as a consultant and conduct the necessary experiments to handle concerns within PM USA that may be microbiological in origin.

To determine the efficacy of Sylgard® as a mold inhibitor in tobacco storage warehouses; draft research proposal dealing with Sylgard® (complete 4th Qtr., 1992).

Consult with the appropriate FTR personnel regarding microbiological problems of mutual interest.

RESPONSIBLE INDIVIDUAL: D. Teng

2021386072

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Operational Support **Program No.:**

Category: Environmental Support **Date Prepared:** 8/20/92

Start Date: Ongoing **Completion Date:** Ongoing

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Develop Process for Phosphine Removal										
from Fumigation:										
Laboratory	K. Prodraza	0.7								
Pilot Unit	D. Fox	1.5								
Develop Method to Imporve Quality of KNO3										
Laboratory	K. Prodraza	0.4								
Pilot Unit	D. Fox	1.6								
Develop Process for Nicotine Removal										
from Biomass:										
Laboratory	R. McCuen	1.3								
Pilot Unit	D. Fox	2.0								
Determine the Source of TKN from Water Effluents	K. Podraza	0.5								
Study Methods for Nicotine Destruction	K. Podraza	0.9								

Type of Support	Support Division	Mgr.
	ARD	
	CAD	
	CTSD	
	PED	
	Semi Works	

2021386073

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

KNO_3 Quality Improvement

Objective
To improve quality of KNO_3 co-product from RL Plant.

Program Benefits
The one customer for the product is in Chapter 11 Bankruptcy. Improved quality will reduce risk and enhance the marketability of this material.

Strategy
Demonstrate a process that improves KNO_3 quality using physical (as opposed to chemical) treatment.

Tactics and Milestones
1. Develop performance criteria and laboratory simulation of a contacting process using an adsorbent to remove materials from a saturated KNO_3 solution - 1st QTR 93
2. Using performance criteria, develop, design, and fabricate a pilot unit - 2nd QTR 93
3. Evaluate process and demonstrate effectiveness - 3rd QTR 93

Resources
Tactic 1 - CRD Leadership
Manpower
CRD - 0.3 MY
ARD - 0.1 MY
PD - 0.1 MY

Tactic 2 - PD Leadership
Manpower
CRD - 0.2 MY
ARD - 0.1 MY
PD - 0.5 MY

Tactic 3 - PD Leadership
Manpower
CRD - 0.1 MY
PD - 0.8 MY

Capital - $10,000

2021386074

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Phosphine Destruction

Objective
To support environmental engineerings development of a catalytic carbon process. Evaluate alternate process that has an economic advantage over the catalytic method.

Program Benefit
The successful demonstration will meet environmental requirements in a cost effective method.

Strategy
Evaluate the feasibility of various chemical treatment processes to determine their effectiveness. Pilot test the most promising alternate.

Tactics and Milestones
1. Review processes and select best option for testing - 1st QTR 93
2. Test alternate process and support development of catalytic process - 3rd QTR 93

Resources
Tactic 1 - CRD Leadership
Manpower
CRD - 0.5 MY
PD - 0.2 MY
ARD - 0.2 MY

Tactic 2 - PD Leadership
Manpower
CRD - 0.3 MY
PD - 1.2 MY
ARD - 0.1 MY

Capital - (Relocate Pilot Scrubber from BHPP) - $10,000

2021386075

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Biomass Treatment Park 500

Objective

To remove nicotine from the biomass (primary, secondary, and centrifuge wastes). Prior to drying which engineering plans to install at Park 500. Investigate biotreatment to remove phosphorus.

Program Benefit

Minimize possible exposure due to nicotine content of waste streams. Possible economic advantage of biotreatment of phosphorus compared to $FeCl_3$ removal.

Strategy

1. Demonstrate a process that removes nicotine.
2. Support engineering development of dryer project.
3. Evaluate feasibility of phosphorus removal.

Tactics and Times Tables

1. Develop performance criteria for bio remediation of Park 500 using existing microbes - 2nd QTR 93
2. Using performance criteria develop pilot unit and test - 4th QTR 93
3. Evaluate alternate phosphorus to recommend if development is warranted - 4th QTR 93

Resources

Tactic 1 - BCR Leadership

Manpower

BCR - 0.7 MY
PD - 0.1 MY
ARD - 0.1 MY

Tactic 2 - PD Leadership

Manpower

BCR - 0.1 MY
PD - 1.9 MY
ARD - 0.1 MY

Tactic 3 - BCR Leadership

Manpower

BCR - 0.5 MY

Capital - $25,000

2021386076

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Total KJELDAHL Nitrogen Reduction

Objective
Determine the sources of the TKN.

Strategy
Evaluate the current analytical procedures and determine the sources of the TKN.

Program Benefit
Expected changes in clean water act (not expected before 1995) will limit TKN discharges.

Tactics and Milestones
1. Determine the impact on nitrate on TKN measurements - 4th QTR 93

Resources
Tactic 1 - CRD Leadership
Manpower
CRD - 0.3 MY
ARD - 0.1 MY
PP - 0.1 MY
BCR - 0.1 MY

2021386077

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Nicotine Destruction

Objective
Investigate methods for nicotine destruction.

Strategy
Evaluate methods and determine economic method for nicotine destruction.

Project Benefits
Economic method for nicotine removal.

Tactics and Milestones
1. Complete evaluation and develop performance criteria if warranted - 4th QTR 93

Resources
Tactic 1 - CRD Leadership
Manpower
CRD - 0.8 MY
ARD - 0.2 MY
PP - 0.1 MY

2021386078

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 OPERATIONAL PLANS FOR OPERATIONS SUPPORT

OBJECTIVE: Assist PM USA, PMI (e.g., IOS) and the other PM Operating Companies with technical consulting regarding company operations as related to insect control.

STRATEGY: Communicate as needed with appropriate personnel to insure worldwide technical support for insect control.

STATUS: Not applicable.

TACTICS: As requested, communicate with personnel and/or visit locations to solve infestation problems.

RESPONSIBLE INDIVIDUAL: D. Faustini

2021386079

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 OPERATIONAL PLANS FOR OPERATIONS SUPPORT

OBJECTIVE: To meet federal/state/local regulatory issues involving air toxic emissions; failure to do so could result in heavy fines, negative publicity, an unsafe environment, and a compromised tobacco.

STRATEGY: Reduce phosphine levels during the fumigation of tobacco storage warehouses.

STATUS: Lower gas levels entering the environment were successfully attained during the July, 1992 fumigation by about a 30% reduction per warehouse in the level of phosphine used and by scrubbing the treated air prior to venting the warehouse to the atmosphere.

TACTICS: Spike all 4 life-stages of the cigarette beetle with the tobacco being fumigation with reduced phosphine in the Richmond, Louisville and Cabarrus storage facilities and determine mortality.

Draft a proposal to conduct cigarette beetle, phosphine dose-response work involving FTR personnel.

RESPONSIBLE INDIVIDUAL: D. Faustini/C. Hayward

2021386080

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 OPERATIONAL PLANS FOR OPERATIONS SUPPORT

OBJECTIVE: To reduce insect infestations in the finished product which could effect cigarette sales.

STRATEGY: Using standard operating procedures (dissecting microscope and literature references) on customer complaints, identify potential insect infestations at the request of Product Audit personnel.

STATUS: As of June 30th, 57 insect-related consumer complaints have been processed.

TACTICS: As requested, examine consumer complaints.

Determine if improper tax stamp application results in compromising the polyethylene outer wrap of the cigarette pack rendering the contents susceptible to cigarette beetle infestation (complete December, 1992).

RESPONSIBLE INDIVIDUAL: D. Faustini

2021386081

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 OPERATIONAL PLANS FOR OPERATIONS SUPPORT

OBJECTIVE: To monitor/evaluate cigarette manufacturing processing equipment on the impact to cigarette beetle (CB) mortality; failure to make this effort when installing new or upgraded equipment could result in CB infestations in the manufacturing area which would ultimately end up in the finished product.

STRATEGY: To determine the mortality on all 4 life-stages of the CB after passage of the tobacco containing CBs through the processing equipment.

STATUS: A 2-step conditioning cycle has been approved for phytosanitary certification of export blended strip at the MZM, McKenney VA processing plant. A 3-step conditioning cycle for the same product has been approved for phytosanitary certification at the 20th St. facility. Studies are underway to gain phytosanitary approval for export cut filler at the Stockton St. plant. CB mortality is being determined in conditioners at the R&D Semiworks that have 1" and 3" leak rates.

TACTICS: Hold meeting with appropriate personnel to insure a beetle-free environment at the Westab Annex of Stockton St. (complete September, 1992); use a trapping program to determine if improved housekeeping procedures are producing a beetle-free environment (complete mid-October, 1992); write a recommendation to discontinue the use of methyl bromide for export cut filler (complete November, 1992).

Continue testing of the conditioner at the Semiworks with 1" and 3" leak rates (complete November, 1992); write a recommendation pertaining to conditioner operation and CB mortality (complete December, 1992).

As requested, examine CB mortality in current and new tobacco processing equipment.

RESPONSIBLE INDIVIDUAL: D. Faustini

2021386082

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

OTHER PROGRAMS

2021386083

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Continuous Improvement **Program No.:**

Category: Continuous Improvement **Date Prepared:** 8/24/92

Start Date: New **Completion Date:** Never

Program Milestones	Responsible Person	Resource Allocation	1993 1 2 3 4	1994 1 2 3 4
Review TQM Programs - Present Overview and recommendations to R&D Management	Ellis	1992		
Develop a plan to integrate TQM/Continuous Improvement initiatives encompassing OMC Departments	Ellis	1992		
Develop an R&D Continuous Improvement Steering Committee to:	R&D Management	0.1		
- coordinate R&D efforts				
- act as a resource				
- develop common goals				
Initiate facilitator training for selected TQM programs(s)	R&D Management	4.0		
Begin TQM Program in R&D	R&D Mgmt & Facilitators	6.0		
Integrate TQM Process with R&D/Operations planning to identify strategic areas of focus for ongoing Continuous Improvement	R&D Management	1.0	ongoing	

Type of Support	Support Division	Mgr.
	ARD	
	CAD	
	CTSD	
	PED	
	Semi Works	

2021386084

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Smoking Laboratory Standardization **Program No.:**

Category: General **Date Prepared:** #

Start Date: Ongoing **Completion Date:** Ongoing

Program Milestones	Responsible Person	Resource Allocation	1993 1 2 3 4	1994 1 2 3 4
Participation in PME Collaborative Study	Mokarry/Mitchell		ongoing	ongoing
Participation in TITL Collaborative Study	Mokarry/Mitchell		ongoing	ongoing
Participation in TIOJ CollaborativeStudy	Mokarry/Mitchell		ongoing	ongoing
Generate/Update Method, Procedure, and and Practices Documentation	Garman/Fenner		ongoing	ongoing
Conform to or prove equivalency to Standard Reference Procedures	Garman/Fenner		ongoing	ongoing
Participate in SLEM/PLEM Mtgs.	Garman/Fenner		ongoing	ongoing
Develop a Quality Manual	Garman			
Initiate a Internal Audit System	Garman			
Consultant to Assess Quality System	Garman			
Apply for Accreditation	Garman			
		TOTAL = 4.0		

Type of Support	Support Division	Mgr.
	ARD	
	CAD	
	CTSD	
	PED	
	Semi Works	

2021386085

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

SMOKING LABORATORY STANDARDIZATION

Strategic Goal #1 Quality

R&D Programs General

I. BACKGROUND

In order to establish realistic product specifications and monitor product conformance to them, it is necessary to ensure the quality of the measurement systems employed. Analytical variation must be minimized to ensure that true product/process variation is being measured.

II. OBJECTIVE

To minimize analytical variation in smoking methodologies used to measure tar and nicotine deliveries of cigarettes products.

III. STRATEGIES

A. Ensure conformance of analytical targets through continued participation in collaborative studies with other domestic and international cigarette information laboratories.

B. Minimize laboratory to laboratory variation through standardization of methods, procedures and laboratory practices.

C. Learn and implement the principles and practices promoted by ISO Method 25. To be in a position to seek laboratory accreditation if warranted.

IV. TACTICS

A. Collaborative Testing

1. Continue participation in monthly PME smoking collaborative study.
2. Continue participation in semi-annual TITL smoking collaborative study.
3. Continue participation in annual TIOJ smoking collaborative study.
4. Continue participation in TTG collaborative testing with international affiliates and licensees.

2021386086

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: _____ Program No.: _____

Category: Measurement of Key Process Variables Date Prepared: _____

Start Date: _____ Completion Date: _____

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
1. Measurement of the modulus of elasticity of filler components.	S. N. Ganeriwala	1.2 PR			X					
2. Determine relationship between modulus of elasticity and CV.	S. N. Ganeriwala	1.2 PR				X				

Type of Support	Support Division	Mgr.								
	ARD									
	CAD									
	CTSD									
	PED									
	Semi Works									

2021386087

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Operational Plan for the Measurement of Key Process Variables

Objective

Improve filling power through an understanding of the effects of key process variables.

Strategy

Determine the relationship between process variables and the physical properties of tobacco utilizing applied mechanics techniques.

Tactics

1. Determine the effect of the modulus of elasticity of filler components on CV.

2021386088

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: _____ Program No.: _____

Category: Critical Defect Detection Date Prepared: _____

Start Date: _____ Completion Date: _____

Program Milestones	Responsible Person	Resource Allocation	1993	1994
			1 2 3 4	1 2 3 4
1. Categorization of critical defects detected by OSIRIS.	T. M. Howell	1.5 PR	TBD	
2. Support implementation of a commercial web system modified for QA inspection of bobbins.	T. M. Howell	1.0 PR	TBD	

Type of Support	Support Division	Mgr.		
	ARD			
	CAD			
	CTSD			
	PED			
	Semi Works			

2021386089

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Operational Plans for Critical Defect Detection

Objective

Provide technical support in the development and/or implementation of commercial vision systems specifically tailored to the applications of PM USA for the improvement of product quality.

Strategy

Implement alternative measurement/monitoring techniques for infrequent but critical defect detection.

Status

Implementation of a web inspection system modified for bobbins is dependent upon a request from QA. Those defects identified by QA as critical will be targeted for categorization by the OSIRIS pack inspection system.

Tactics

1. Categorization of critical defects detected by OSIRIS pack inspection systems to be used by QA in maintaining product uniformity.
2. Support implementation of a commercial web system modified for the inspection of bobbins in QA.

2021386090

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: _____ **Program No.:** _____

Category: Quality **Date Prepared:** 8/25/92

Start Date: _____ **Completion Date:** _____

Program Milestones	Responsible Person	Resource Allocation	1993 1 2 3 4	1994 1 2 3 4
Develop tests which relate to product integrity and thermal damage. Evaluate possible relation to altered product subjectives.	W. Hempfling	0.2		
Evaluate data from pack film study and other sources for possible chemical tests for product quality with respect to taste stability	B. Handy	0.2		
Evaluate possible applicability of results from studies of flavor changes on product	D. Watson	0.1		
Utilize information from various analytical-subjective studies to determine if any are sufficiently valid for use as an audit marker for product taste at retail	R. Fenner	0.1		

Type of Support	Support Division	Mgr.
Additional information is in plans for Tobacco Technology and flavor change on product	ARD	
	CAD	
	CTSD	
	PED	
	Semi Works	

2021386091

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

PHILIP MORRIS U. S. A.

INTER-OFFICE CORRESPONDENCE

Richmond, Virginia

To: D. Leyden **Date:** August 19, 1992

From: R. Ferguson

Subject: ***Operational Plans for 1993 R&D Commitments***

PROG. CATEGORY: Quality

ITEMS: Quality at Retail, Quality Audit

OBJECTIVE: Provide support, as requested by Quality Assurance, to establish a technical understanding of the impact of age/shelf life on the quality of finished product. An additional objective would be to develop methods in support of competitive quality audits.

STATUS: Quality Assurance has ascertained that at present there is no available test which would predict product exposure to adverse conditions and increased likelihood of subjective variation or even T/O/S complaints. Historically, present tests such as OV and tar per puff have not produced actionable results.

Since extensive consumer testing has indicated that consistent taste is the most important attribute to customers, the development, if possible, of some more meaningful tests than presently available is a ***prerequisite*** for any additional contemplated PM product or competitive audit studies which contemplate evaluating a parameter such as "taste."

STRATEGY: Develop tests which relate to product integrity and evaluate their possible validity by use of subjective screening.

TACTICS: Investigate the possible applicability of research being conducted in R&D on blend storage (release of CO_2 in response to heating). Additional information on this tactic is contained in Tobacco Technology operational plans.

RESP. PERSON: W. Hempfling

2021386092

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

TACTICS: Evaluate Marlboro standardization and packaging film ageing study data to see if other parameters offer a potential for method development.

RESP. PERSON: B. Handy

STRATEGY: Complete analytical and subjective model studies on the removal and addition of moisture for Marlboro cigarettes.

TACTICS: Monitor this activity which is ongoing in Operations Support.

Exploit any opportunities which relate to Quality Assurance needs.

RESP. PERSON: D. Watson

STRATEGY: Utilize information developed in previous strategies to cooperate in the design of future quality audit procedures.

TACTICS: The timing and exact tactics will be dependent upon the outcome of previous strategies.

RESP. PERSON: R. Fenner

2021386093

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: _____ Program No.: _____

Category: Pack Inspection Date Prepared: _____

Start Date: _____ Completion Date: _____

Program Milestones	Responsible Person	Resource Allocation	1993 1 2 3 4	1994 1 2 3 4
1. Address problems involving modifications to the defect detection algorithm.	T. M. Howell	1.0 PR	on-going	
2. Support training of factory operators.	T. M. Howell	0.3 PR	on-going	
3. Establish a final list of changes to OSIRIS for implementation by ITRAN.	T. M. Howell	0.2 PR	TBD	

Type of Support	Support Division	Mgr.		
	ARD			
	CAD			
	CTSD			
	PED			
	Semi Works			

2021386094

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Operational Plan for Pack Inspection

Objective
Implementation of pack inspection systems specifically tailored to the application of PM USA for the improvement of product quality and manufacturing efficiency.

Strategy
Support Engineering in the implementation of OSIRIS.

Status
A plan for the implementation of multiple units will be determined at the end of August in a meeting of Plant Managers.

Tactics
1. Address problems involving modifications to the defect detection algorithm.
2. Support training of factory operators.
3. Collaborate with Engineering in establishing a final list of changes to OSIRIS software for implementation by ITRAN.

2021386095

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: _____ Program No.: _____

Category: Cigarette Design Date Prepared: _____

Start Date: _____ Completion Date: _____

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Strategy 1.	J. W. Kao	0.1 PR	on-going							
1.1 Establish communication mechanisms across										
functions and divisions.		0.1 PR	on-going							
1.2 Define individual (group) roles and functions		0.1 PR	on-going							
1.3 Determine priorities										
Strategy 2.	J. W. Kao									
2.1 Comprehensive theoretical derivation and		0.1 PR	on-going							
simulation including perforations.										
2.2 Multiple-segment filter model		0.2 PR		X						
development.										
2.3 Charcoal filter model development.		0.2 PR		X						
2.4 Menthol model development.		0.2 PR				X				
2.5 Filter hardness model development.		0.2 PR				X				
2.6 Paper web model development.		0.2 PR		X						
2.7 Model and code modifications.		0.2 CAD							X	
Strategy 3.	J. W. Kao									
3.1 Chalk-level model development.		0.2 PR	on-going							
3.2 Sidestream visibility model development.		0.2 PR	X							
3.3 Wood pulp model development.		0.2 PR				X				
3.4 Model and code modifications.		0.2 CAD							X	
Strategy 4.	J. W. Kao									
4.1 Review and verify the existing models/		0.1 PR	X							
approaches.										
4.2 Develop/modify blend models.		0.2 PR					X			
4.3 Develop/modify rod hardness model.		0.2 PR					X			
4.4 Model and code modifications.		0.2 CAD							X	
Strategy 5.										
5.1 Evaulation, prototype, and design of graphic		0.2 CAD	X							
and language environment.										
Type of Support	**Support Division**	**Mgr.**								
	ARD									
mathematician with programming skills	CAD									
	CTSD									
	PED									
	Semi Works									

2021386096

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: _____ Program No.: _____

Category: Cigarette Design (continued) Date Prepared: _____

Start Date: _____ Completion Date: _____

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
5.2 User interface development.	R. J. Maher	0.2 PED	X							
5.3 Model conversion and development.	J. W. Kao	0.2 CAD						X		
5.4 Data base linkage/interface	J. W. Kao	0.2 PR				X				
development.										
5.5 Goal seeking capability.	J. W. Kao	0.1 PR						X		
5.6 User manual and documentation.	J. W. Kao	0.1 PR						X		
5.7 User training.	J. W. Kao	0.1 PR							X	
5.8 System installation.	J. W. Kao	0.1 PR							X	
5.9 User group formation.	J. W. Kao	0.1 PR							X	

Type of Support	Support Division	Mgr.
	ARD	
mathematician with programming skills	CAD	
	CTSD	
	PED	
	Semi Works	

2021386097

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

OPERATIONAL PLAN FOR THE EFFECTIVE AND INTEGRATED CIGARETTE DESIGN PROJECT

J. W. H. Kao
August 18, 1992

A. OBJECTIVE

Devise an effective and integrated computer-aided cigarette design program to strategically fulfill PM's short-term and long-term goals. Specifically, the simulation program enables one to predict cigarette performance based on design specifications or vice versa, by linking design parameters, performance (deliveries), and cost data.

B. BACKGROUND

The recent advance of computer technology in the past two decades has drastically changed the way products are designed: the application of computer simulations has become an integral part of a business. As product brand proliferates and product life cycles grow shorter and shorter, product development can't keep pace without computer-aided design. Indeed, computer-aided product design can be the lifeblood for a company to stay competitive in quality and cost.

A burning cigarette comprises a large number of complex chemical and physical systems. A cigarette designer varies determinants which affect performance (tastes, aromas, smoke deliveries, draw resistance, etc.) to meet the expanding challenges of today's cigarette market. Both economic and technical factors must be taken into account. The current environment is forcing PM USA to be more effective and efficient in cigarette design.

Our cigarette business requires prototypes to be made and tested before a brand introduction, extension, or modification. Numerous prototypes have been made in the past and many of them are simply repetitions of previous results or unnecessary screening candidates. This laborious, time-consuming, expensive, and trial-and-error approach can be significantly modified if an adequate computer-aided cigarette design tool is available. Nevertheless, the computer modelling activities in PM USA have taken a relatively reactive mode in cigarette design due to the existing system's lack of total integration, comprehensive functionality, accuracy, and feedback mechanism. The competitive pressure in cost as well as the forthcoming regulation on ignition propensity will require us to take a proactive role in cigarette design.

Various modelling activities, ranging from varying one variable to many variables, occurred elsewhere in R&D, but most of them focused on project/divisional objectives. The two most publicized activities in cigarette design came from Hartung's

2021386098

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

and Dwyer's groups. In addition, R&D Neuchatel has a different simulation program for cigarette design. Unfortunately, the existing modelling capabilities/knowledge bases are not integrated and compatible, and their user friendliness can be further improved to increase productivity. Furthermore, due to the evolution process through many years of development, the existing computer codes and structures need to be revisited and redesigned to adapt to the current computer technology, instead of the piecemeal and patch-up approach, in order to ensure smooth maintenance and enhancement, for the future.

The existing models do not completely capture the abundant information hidden in the vast lab/CI data bases. This problem may be attributed to the fact that there is no formal mechanism to ensure that the model builders are aware of the new product features and the related experimental design for prototypes at the early stage. Due to the lack of communication, coupled with the lack of strong management support/focus and a formal feedback mechanism from users, model builders tend to react to situations. The lack of a feedback mechanism significantly deprives the opportunity to verify the related model and improves its accuracy.

The two strategic goals of PM USA which are closely related to R&D activities are (1) top quality producer of category and (2) low cost producer of category. With appropriate support and organization, the computer cigarette design program is viable to be one of the most important tools to achieve our strategic goals. Namely, by relating cigarette performance to design variables, one can achieve the following goals/benefits:

Benefits:

(1) Achieve better design (with respect to cost, machinability, and quality) through exploitation or optimization by computer simulation.
(2) Obtain cost savings through reducing labor, material, and machine- time requirements in design and experimental trials.
(3) Reduce cycle time for new product development and brand modifications.
(4) Respond effectively to various external regulation challenges such as ignition propensity.
(5) Make full use of existing data and provide greater availability of design tools.
(6) Offer a tool for consolidating materials specifications.
(7) Provide an effective learning tool offering a broad view for cigarette design.
(8) Capture the knowledge needed for succession.

In view of the importance of cigarette design, an interview process recommended by management has been conducted. The input is extremely positive and encouraging, and clearly shows the needs and wants for a better system. The issues which have been discussed in the process are broad and a multidisciplinary approach with activities across divisional boundaries is required to attack these issues. A high-performance team and unbridled information are critical success factors for this project.

2021386099

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

A formal and regular communication channel among relevant divisions must be established and a direct access to all relevant models and data bases must be made available to the team. Data (bases) are only useful if they can be available for extraction of information, verification of new data, or verification of model calculations. To be effective, the team must take a comprehensive and careful review of the existing data, models, and software. Although the Dwyer program will be the basis of this work, models of different purposes and different locations must be consolidated and integrated by identifying weakness and strength. To be predictable, theoretical approaches will be preferred over empirical approaches; however, the latter may be inevitable for some cases.

C. STRATEGIES

1. Plan and organize activities for integration and consolidation.
2. Develop an effective and integrated filter modelling system.
3. Develop an effective and integrated wrapper modelling system.
4. Develop an effective and integrated blend modelling system.
5. Address the user-friendliness issues.

D. TACTICS

Strategy 1.

1.1 Establish communication mechanisms across functions and divisions.-Q4 '92
1.2 Define individual (group) roles and functions.-Q4 '92
1.3 Determine priorities.-Q4 '92

Strategy 2.

2.1 Comprehensive theoretical derivation and simulation including perforations.-Q4 '92
2.2 Multiple-segment filter model development.-Q2 '93
2.3 Charcoal filter model development.-Q2 '93
2.4* Menthol model development.-Q4 '93
2.5* Filter hardness model development.-Q4 '93
2.6* Paper web model development.-Q2 '93
2.7 Model and code modifications (on-going activities needed for model refinements and enhancements).-Q3 '94

Strategy 3.

3.1 Chalk-level model development.-Q4 '92
3.2 Sidestream visibility model development.-Q1 '93
3.3* Wood pulp model development.-Q4 '93

2021386100

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

3.4 Model and code modifications (on-going activities needed for model refinements and enhancements).-Q3 '94

Strategy 4.

4.1* Review and verify the existing models/approaches.-Q1 '93
4.2* Develop/modify blend models.-Q1 '94
4.3* Develop/modify rod hardness model.-Q1 '94
4.4* Model and code modifications (on-going activities needed for model refinements and enhancements).-Q3 '94

Strategy 5.

5.1 Evaluation, prototype, and design of graphic & language environment.-Q1 '92
5.2* User interface development.-Q1 '93
5.3* Model conversion and development.-Q2 '94
5.4* Data base linkage/interface development.-Q4 '93
5.5* Goal seeking capability.-Q2 '94
5.6* User manual and documentation.-Q2 '94
5.7 User training (on-going activity)-Q3 '94
5.8* System installation.-Q3 '94
5.9* User group formation.-Q3 '94

E. RESOURCE ALLOCATION

The projected resource allocation for the cigarette design program is 4.00. This total does not include the Product and Process Development resources which will be required for collecting new data (if it is deemed necessary after reviewing the existing data and models), evaluation of the resulting model refinements and enhancements, and knowledge/information transfer.

Physical Research	3
Computer Applications	1
Total	4

The resources specified above are the minimum needed for the successful completion of the project in a timely fashion (i.e., within the two year time frame). Any reduction in resource allocation will impact the integrity of the plan by significantly reducing the scope and increasing the time frame to meet needs. For example, a reduction of resource allocation from four to two will eliminate the activities masked with "*" in the TACTICS section.

2021386101

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: TLA Upgrade **Program No.:**

Category: Cost/Productivity **Date Prepared:** 8/24/92

Start Date: 1/1/93 **Completion Date:** 1994

Program Milestones	Responsible Person	Resource Allocation	1993	1994
			1 2 3 4	1 2 3 4
Coordinate and review TLA testing and				
procedures with those performed in R&D	Fenner (CTSD)	1.0		
laboratories (CTSD, ARD)	Ferguson (ARD)	0.2		
Utilize TLA data in Tobacco Technology research;	Hempfling	0.5	ongoing	
identify/recommend significant TLA component				
analyses				
Integrate/standardize TLA testing in Europe and	Fenner			
USA; include in collaborative testing protocols				
- Flow chart logistics				
- Compare information systems				
TQAF 1.5				
Leaf 0.4				
IS 0.5				

Type of Support	Support Division	Mgr.
Manager	ARD	
	CAD	
Manager	CTSD	
	PED	
	Semi Works	

2021386102

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: CO Catalysis Program No.: _____

Category: Other Programs Date Prepared: _____

Start Date: _____ Completion Date: _____

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
1. Determine structural properties effecting	K. H. Shafer	0.5 ARD				X				
catalyst stability.		0.5 CR								
		0.3 Univ.				X				
2. Determine CO oxidation rate dependency	K. H. Shafer	0.2 ARD			X					
on linear velocity.		0.2 CR								
3. Determine adsorption properties of catalyst	K. H. Shafer	0.2 ARD			X					
for tobacco volatiles.		0.2 CR								
4. Determine CO oxidation rate	K. H. Shafer	0.3 PR			X					
in the presence of cigarette smoke.		0.2 CR								
5. Characterize the effect of CO catalyst on cigarette	K. H. Shafer	0.5 INBIBFO				X				
smoke.		0.2 CR								
6. Maintain appropriate filter development criteria	A. L. Finley	0.2 CT	on-going							
7. Transfer of synthesis technology from Seton Hall	J. I. Seeman	0.2 CR	X							
to PM for potential scale-up.										

Type of Support	Support Division	Mgr.
Microscopy and NMR	ARD	
	CAD	
	CTSD	
	PED	
	Semi Works	
In support of Milestone 1.	INBIFO	
ESCA at Univ. of Pittsburgh		

2021386103

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Operational Plan for CO Catalysis

Objective

To develop catalysts for incorporation into cigarette filters which reduce the amount of carbon monoxide delivered to smokers.

Strategy

Characterization of the chemical and physical properties of the most promising catalysts culminating from contract research at Seton Hall.

Status

The use of granulated CO catalysts in the filters would help to control the delivery of CO independent of tar delivery. However, this goal has been pursued for years with no success because of the absence of efficient CO catalysts which work at room temperature. We currently have a contract with Dr. Robert L. Augustine of Seton Hall University to perform this research. He is a foremost expert in catalyst preparation. His group is developing catalysts and determining their stability. The highest priority of this research for the remainder of the year is to extend the stability of the most promising catalysts past 6 weeks.

Tactics

1. Determine structural properties effecting catalyst stability.
2. Determine CO oxidation rate dependency on linear velocity.
3. Determine adsorption properties of catalyst for tobacco volatiles.
4. Determine CO oxidation rate in the presence of cigarette smoke.
5. Characterize the effect of CO catalyst on cigarette smoke.
6. Maintain appropriate filter development criteria.
7. Transfer of synthesis technology from Seton Hall to PM for potential product scale-up.

2021386104

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Predictive Maintenance **Program No.:** _____

Category: Other Programs **Date Prepared:** _____

Start Date: _____ **Completion Date:** _____

Program Milestones	Responsible Person	Resource Allocation	1993				1994			
			1	2	3	4	1	2	3	4
Strategy 1.										
1.a-d	S. N. Ganeriwala	0.2 PR	X							
2.a,b		0.2 PR	X							
3.a-c		0.2 PR	X							
4.a,b		0.2 PR		X						
4.c		0.1 PR			X					
4.e		0.1 PR				X				
Strategy 2.										
1		0.2 PR	X							
2.a,b		0.2 PR	X							
4		0.3 PR		X						
5.a		0.2 PR								X
5.b-d		0.2 PR				X				
6.a-c		0.3 PR								X
7.a		0.2 PR			X					
7.b		0.3 PR						X		
8		0.1 PR								X
Strategy 3.										
1		0.3 PR			X					
2		0.2 PR			X					
3,4		0.2 PR				X				
Strategy 4.		0.3 PR				X				
Strategy 5.		0.5 CAD								X

Type of Support	Support Division	Mgr.
	ARD	
Mathematician with programming skills	CAD	
	CTSD	
	PED	
	Semi Works	

2021386105

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Operational Plan for Predictive Maintenance

Objective

Develop vibration analysis techniques that will enable PM to have an effective predictive maintenance and machinery performance improvement program.

Status

The predictive maintenance effort is in support of the Total Maintenance Program. All R&D activities are coordinated with Applied Technology, York Engineering and manufacturing personnel.

Strategies

1. Develop an effective predictive maintenance program for packing machinery.
2. Develop analytical methods for diagnostic analysis of all machinery.
3. Determine machinery design modifications to solve frequently occurring problems.
4. Develop damping technology for reducing noise and vibration of make-pack equipment.
5. Develop an expert system for monitoring machine health, problem detection, performing diagnostics, and reporting.

Tactics

Strategy 1.

1. Establish procedures for monitoring and developing performance histories for G.D. packers, wrappers, and cartoners.
   a. Develop an understanding of the kinematics of the G.D. packing machinery by working at the Manufacturing Center, York Engineering, and G.D., Richmond.
   b. Discuss important problems with consultants experienced with such machinery.
   c. Investigate different types of sensors such as force gauges, accelerometers, displacement transducers to monitor and trend vibrations of various locations.
   d. Evaluate various analysis techniques to determine an appropriate method to monitor and trend historical data.

2. Identify critical machine locations to permanently install suitable sensors.
   a. Obtain locations of frequent breakdowns by talking with maintenance supervisors and examining log books.
   b. Obtain the characteristic vibration signature of packing equipment.
   c. Determine vibration transmission paths and dynamics of machines.

3. Mount sensors on the G.D. equipment.
   a. Determine suitable vendor and order sensors and accessories.
   b. Establish mounting procedure.
   c. Install sensors.

4. For the G.D. machinery, obtain operational histories and establish trends for adequate statistics and analysis.
   a. Transfer the data collection process to Engineering and Manufacturing personnel.

2021386106

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

b. Train vibration analysts collecting the data.
c. Analyze the data and correlate with machine breakdowns.
d. If necessary, redefine sensor types and locations.
e. Using statistical and analytical methods, establish parameters and alarm levels for machine breakdowns.

5. Repeat the above steps for the Sasib packing equipment.

Strategy 2.

1. Verify empirical relationships used in commercial softwares. The equations were established from measurements made on simple machinery and may need a modification for our complex machinery.
2. Supplement commercially available software with post processing capabilities.
   a. Develop algorithms for the computation of the cepstrum, phase angle correlation, time waveform reconstructions, polar plots, and other functions from the measured data.
   b. Investigate if the above functions provide a better physical picture and hidden trends not discernable using canned software procedures.

3. Keep abreast of evolving instrumental and signal processing capabilities.

4. Develop new measurement techniques as needed. At a few locations on makers, we are experiencing difficulty in predicting part failure using conventional vibration measurements. Acoustic emission may provide the useful information for predicting the failure.

5. Determine forcing function profiles and vibration transmission paths for cause and effect analysis.
   a. Design lab scale models of some important mechanisms. This will provide a convenient and expedient method to determine effects of operating variables on measured parameters.
   b. Introduce a fault and/or design correction, on lab models and/or actual machines, to develop force-response relationships.
   c. Obtain vibration characteristics as a function of operational variables.
   d. Perform transfer function and other correlation analyses using lab models and actual machinery. This will enable us to develop a sound diagnostic system. It could be further refined for expert system development.

6. Develop computer simulation models for make-pack machinery.
   a. Simulate waveform representative of machine mechanisms.
   b. Compute spectra, other parameters of interest.
   c. Perform sensitivity analysis.
   d. Compare results of item c with lab models and actual mechanism.
   e. Modify simulation models

2021386107

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

7. Develop software to correlate vibration data with other types of measurements such as noise, acoustic emission, temperature, and oil analysis.
   a. Set up a procedure for incorporating results of noise, temperature, oil analysis, and measurements with vibration data.
   b. Perform correlation analysis to check the predictions of each measurement.

8. Perform indepth analysis of data to establish parameters and alarm levels for obtaining trends.

Strategy 3.
1. Determine dynamics of the machine component using modal testing and finite element modeling techniques.
2. Develop approach to dampen attenuated resonances.
3. Determine alternate methodologies to solve the problem.
4. Suggest solutions to engineering personnel for implementation.

Strategy 4.
1. Keep abreast of the techniques and materials used for introducing damping into structural members.
2. Determine the resonance frequency and the mode shape.
3. Material selection, testing, and designing configuration for effective application.

Strategy 5.
1. Document all failures, vibration levels, causes of breakdown and analysis.
2. Develop a dictionary of the dynamics of machinery and rules of cause and effect analyses as information becomes available.
3. Develop some algorithm for asking questions leading towards problem diagnosis.

2021386108

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: _____ Program No.: _____

Category: Dynamic Scheduling Date Prepared: _____

Start Date: _____ Completion Date: _____

Program Milestones	Responsible Person	Resource Allocation	1993 1 2 3 4	1994 1 2 3 4
1. Support investigation of technical feasibility.	K. H. Shafer	0.1 PR	TBD	
		0.5 CA		
2. Support assessment of potential	K. H. Shafer	0.1 PR	TBD	
impact on factory scheduling.		0.5 CAD		

Type of Support	Support Division	Mgr.		
	ARD			
Mathematician with programming skills	CAD	1		
	CTSD			
	PED			
	Semi Works			

2021386109

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Operational Plan for Dynamic Scheduling

Objective

Improve efficiency and flexibility of production scheduling.

Strategy

Support development of dynamic scheduling based on chaos theory.

Tactics

1. Support the investigation of the technical feasibility.
2. Support the assessment of the potential impact on factory scheduling.

2021386110

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

1993 R&D OPERATIONAL PLAN

Program Summary

Program: Factory Planning **Program No.:**

Category: Technology Assessment **Date Prepared:** 8/28/92

Start Date: 1/93 **Completion Date:** TBD

Program Milestones	Responsible Person	Resource Allocation	1993 1 2 3 4	1994 1 2 3 4
Support investigation of technical feasibility	K. Shafer	0.1PR	TBD	
of computer aided factory planning		0.5CAD		
Support of assessment of potential impact	K. Shafer	0.1PR	TBD	
on factory planning		0.5CAD		

Type of Support	Support Division	Mgr.		
	ARD			
Mathematician with programming skills	CAD			
	CTSD			
	PED			
	Semi Works			

2021386111

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000

Operational Plan for Factory Planning

Objective

Improve capabilities to simulate plant processes to aid in factory layout.

Strategy

Support simulation of flow dynamics of processes in factory.

Tactics

1. Support investigation of technical feasibility.
2. Support assessment of the potential impact on factory planning.

2021386112

Source: https://www.industrydocuments.ucsf.edu/docs/qppk0000